

July 1933

RAILWAY

TRACK *and* STRUCTURES

For Long Life and Dependable Service-

THE
IMPROVED
FAIR



THE P & M CO.

CHICAGO • NEW YORK • DENVER • ST. LOUIS • BOSTON • ST. PAUL • WASHINGTON • SAN FRANCISCO • MEXICO CITY

This Issue ...

How the RF&P
Saves Welded Rails

Fire Protection at
Industrial Facilities

Painting the
Long Bridge

Economics of Snow
Control at Switches

Contents--Page 645



He doesn't use this wrench much anymore!

with RELIANCE HY-PRESSURE HY-CROME

IN SPITE of heavy wheel loads and high speeds, your track joint bolts will stay tighter longer reducing time between maintenance periods.

Less maintenance when Reliance Hy-Pressure Hy-Crome Spring Washers are used on rail joint bolts. The result will be a savings in time and cost and an easing up of tight maintenance schedules.

Reliance Hy-Pressure Hy-Crome Spring Washers have been designed so that the automatic mechanical action of the helical coil spring washer will flatten at a predetermined applied load. They are manufactured from alloy spring steel to provide adequate reactive pressure and a wide range of reaction to compensate for looseness as a result of service wear.

Our railroad fastening engineers will be pleased to submit samples and engineering data on Reliance Hy-Pressure Hy-Crome Spring Washers for a test application on your track.

*spring washers
on the job!*



"Edgemark of Quality"



MANUFACTURING COMPANY, RELIANCE DIVISION

OFFICE AND PLANTS • MASSILLON, OHIO
SALES OFFICES: NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST. LOUIS
SAN FRANCISCO • MONTREAL



The Stand That Takes the Nuisance Out of Switch-Point Adjustment



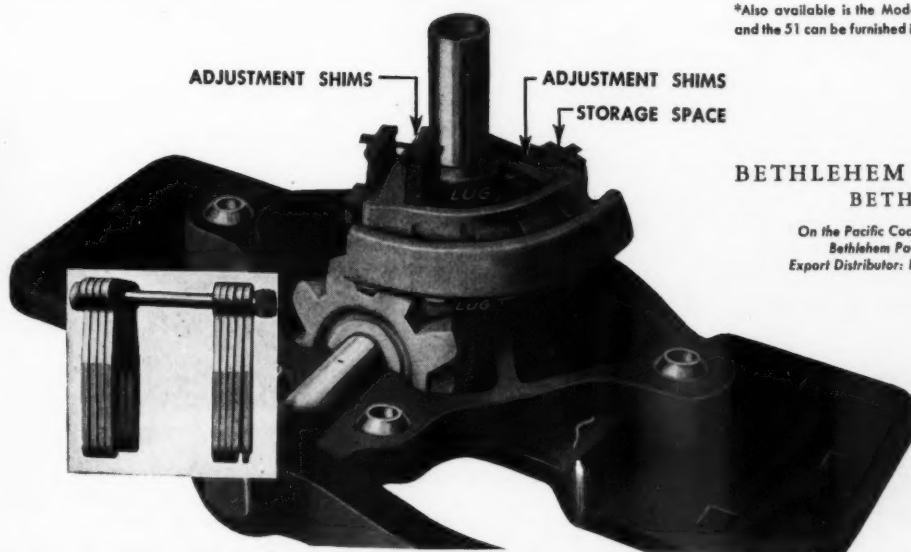
Adjusting points can be a nuisance and a time-waster. Yet where Bethlehem's New Century Switch Stand is used, there is nothing tough at all about the job.

The Model 51* makes possible switch-point adjustment by a simple device inside the stand itself. You merely slide back the cover, insert or remove a shim or two, and the job is done. Adding shims increases the throw of the points; removing decreases the throw. As shown in the cutaway photo, adjustment of movement in either direction can easily be accomplished.

The necessary shims are furnished with the switch stand, and spares can be kept in the handy storage compartments, where they are quickly available. It is virtually impossible to lose them.

But the New Century doesn't rely on any one device for its general effectiveness. For over 50 years, with few basic changes, it has been widely used by the country's great railroads—proof, we believe, that its principles are sound. You'll find it better than ever today for service with heavy rail—60-lb and up—in main lines, branch lines, yards. Ask for full details.

*Also available is the Model 50, a nonadjustable type. Both the 50 and the 51 can be furnished in a low design and an intermediate design.



BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation



Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, one year \$2.00 (special rate to railroad employees only, one year \$1.00). Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Bristol, Conn. Volume 49, No. 7.

Ribbonrail Service...

IN YOUR USED RAIL PROGRAM

*Will Save
You Money*

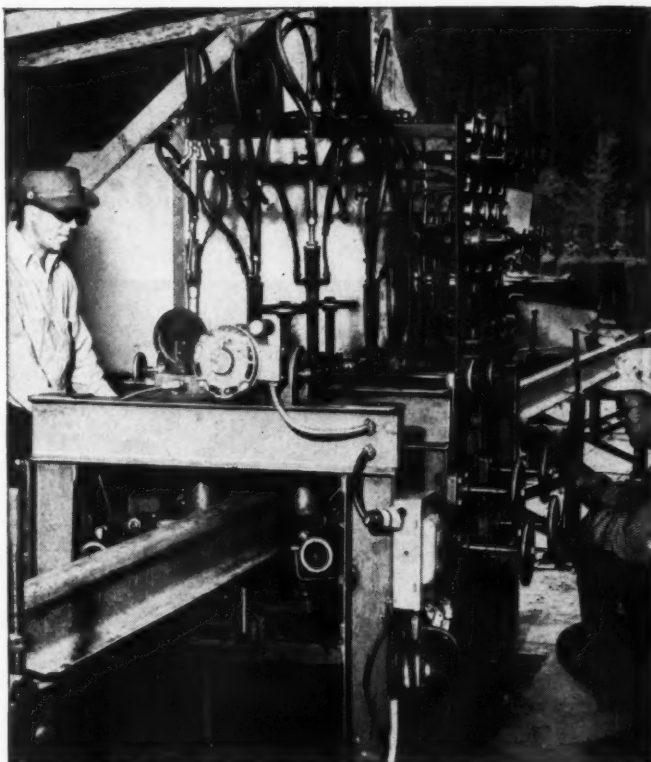
It's poor economy to re-drill cropped rail for re-use in secondary or yard track. When you do that you end up with 300 or more joints per mile — joints that multiply maintenance expense.

Many railroads are cutting maintenance costs by using OXWELD's RIBBONRAIL Service and equipment to make used rail into continuous welded rail — for use in secondary locations. The multiple lengths save you money. Here's how:

Put your used rail into a RIBBONRAIL Service program and save money. Ask OXWELD for more information.



"Ribbonrail" is a service mark, and "Oxweld" is a trade-mark of Union Carbide and Carbon Corporation.



RIBBONRAIL Service at work — an OXWELD pressure-welding machine quickly produces continuous rail.



Cropping battered ends of used rail prepares the rail for welding . . . the same equipment used for new rail performs this operation.

The cropped rail ends are welcome in the scrap drive . . . You help the national defense effort, and get a premium price for the scrap.

RIBBONRAIL needs no joint maintenance since there are no joints.

Used rail lasts longer when it becomes RIBBONRAIL . . . there are no ends to batter, no joints to wear.

OXWELD RAILROAD SERVICE COMPANY
A Division of Union Carbide and Carbon Corporation
UCC
Carbide and Carbon Building Chicago and New York
In Canada:
Canadian Railroad Service Company, Limited, Toronto

WHERE SMOOTH OPERATION COUNTS!

TUCKING a new overpass structure in under an active right-of-way isn't always so simple. Here's the kind of a place where smooth operating equipment counts. Jobs like this call for a smooth handling rig — one that can move out of the way surely and quickly, one with dependable controls and one that has the versatility for fitting itself into and solving the unusual problems.

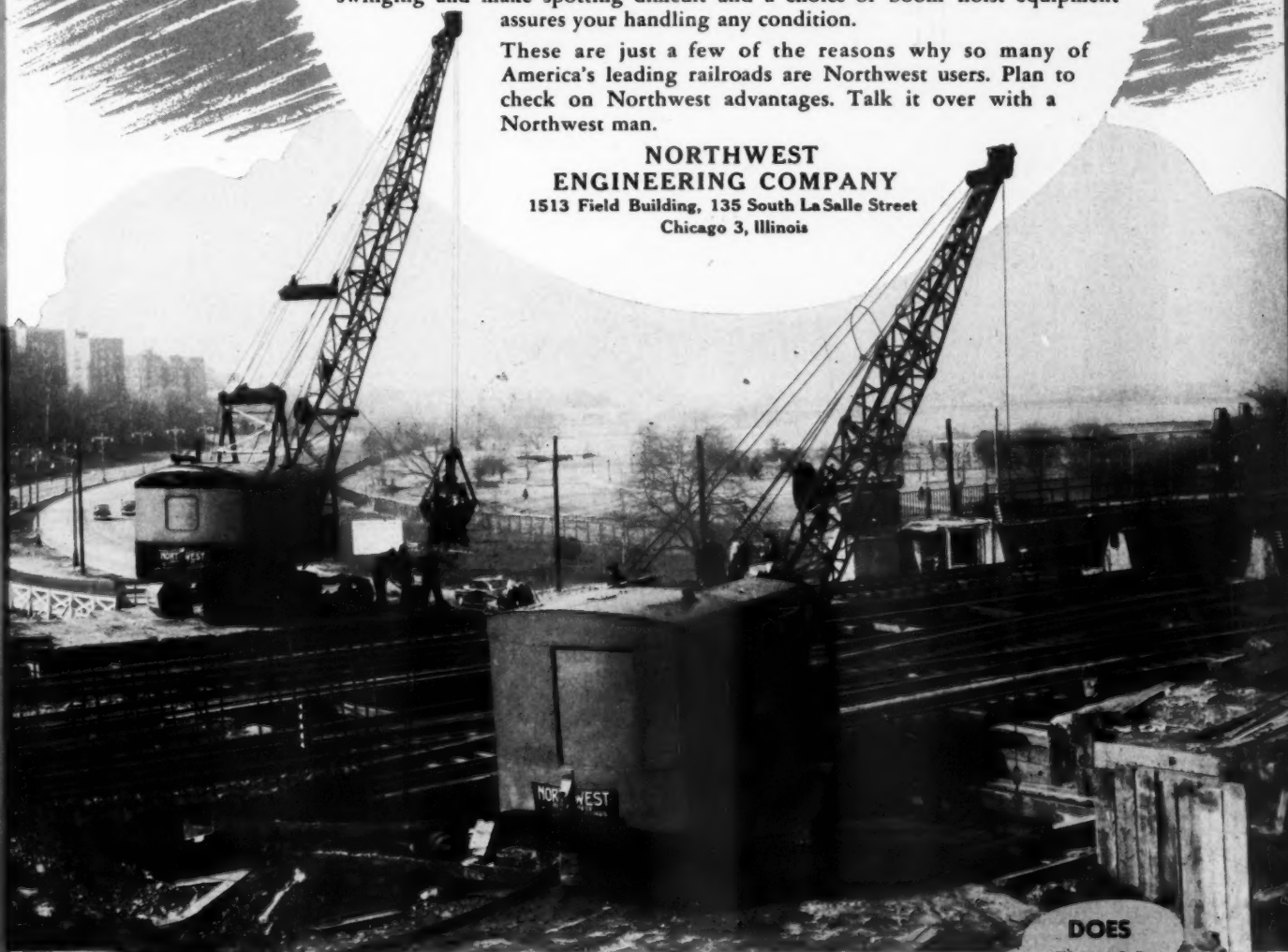
The Northwest Crawler Crane has proved itself an ideal railroad rig. Northwest Crawlers and Northwest Steering negotiate the bad ground conditions of off track work. The larger Northwests bring you positive traction on *both* crawlers while turning as well as when going straight ahead.

The Northwest "Feather-Touch" Clutch Control makes operation easy. It gives you the *feel of the load*, it is free from the complications of piping, pumps and valves, release is positive and it can be disconnected at any time. There can be no shutdown because of control failure.

Uniform Pressure Swing Clutches take out the jerks and grabs that set a load to swinging and make spotting difficult and a choice of boom hoist equipment assures your handling any condition.

These are just a few of the reasons why so many of America's leading railroads are Northwest users. Plan to check on Northwest advantages. Talk it over with a Northwest man.

**NORTHWEST
ENGINEERING COMPANY**
1513 Field Building, 135 South La Salle Street
Chicago 3, Illinois



NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL



DOES
THINGS
NO TRACK-TYPE
RIG CAN DO



PENTA* GIVES LASTING STRENGTH TO WOOD

new Valparaiso bridge protected against
termites and decay—service life doubled



The Dow Chemical Company
Dept. PE3-3B4, Midland, Michigan

Please send me: _____ Plant wood treating specifications.
_____ Valuable booklet, "Pointers on Penta".
_____ Sources of treated wood.

Name _____

Title _____

Company _____

Address _____

City _____ State _____

The above bridge spans the Grand Trunk right-of-way in Valparaiso, Indiana. All wood in this bridge was pressure treated with PENTA for positive protection against termites and decay. PENTA will keep the large timbers strong—actually make them last 2 to 4 times longer. Maintenance will be less on this bridge, too, because PENTA protection is permanent. Construction problems were simplified since the PENTA treated wood was clean and easy to handle. Valparaiso can look forward to many years of reliable, trouble-free service from this PENTA-protected bridge.

Specify PENTA protection for all car lumber, platforms, buildings, ties and poles. Write Dow TODAY for information about *PENTACHLOROPHENOL. THE DOW CHEMICAL COMPANY, Midland, Michigan.

you can depend on **DOW CHEMICALS**



RAILWAY TRACK and STRUCTURES

Spray car checks weed growth— TIMKEN® bearings check wear

TO help keep their W78 weed spray car in top operating condition at all times, Fairmont Railway Motors, Inc. mounts its axles on Timken® tapered roller bearings.

The spray car rolls smoothly because Timken bearings' true rolling motion and extremely smooth surface finish practically eliminate friction.

Bearing closures are more effective, too. Timken bearings hold axles concentric, making seals more effective in keeping lubricant in—dirt, dust and moisture out. Lubricant costs are cut.

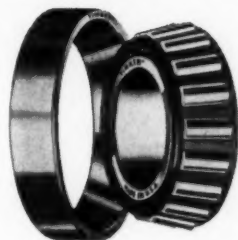
Heavy loads are no problem either—line contact between rollers and races gives Timken bearings extra load-carrying capacity.

No other bearing gives you all

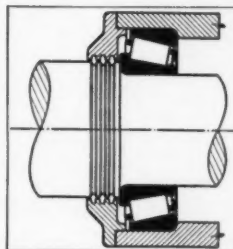
the advantages you get with Timken bearings. Make sure they're in all the equipment you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



LUBRICANT STAYS IN —DIRT KEPT OUT

Because Timken bearings hold shafts concentric with housings, closures are made more effective. Lubricant is retained, dirt and moisture kept out.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

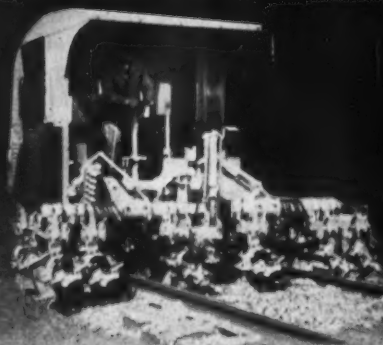
RAILWAY TRACK and STRUCTURES

For additional information, use postcard, pages 677-678

JULY, 1953 613

... for maintenance and construction

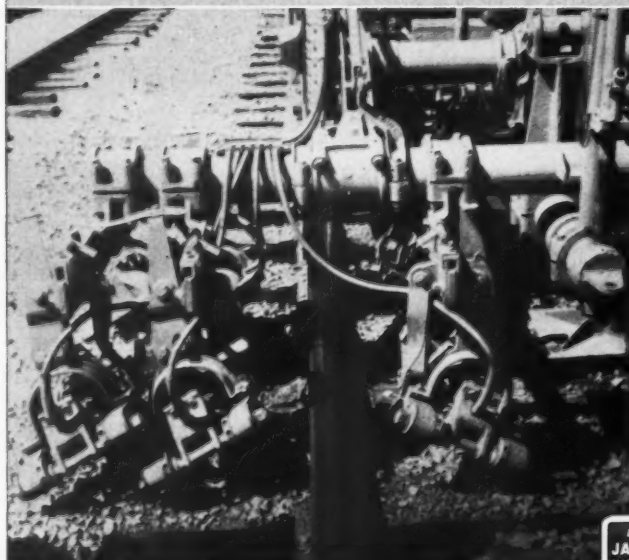
JACKSON MULTIPLE TAMPERS



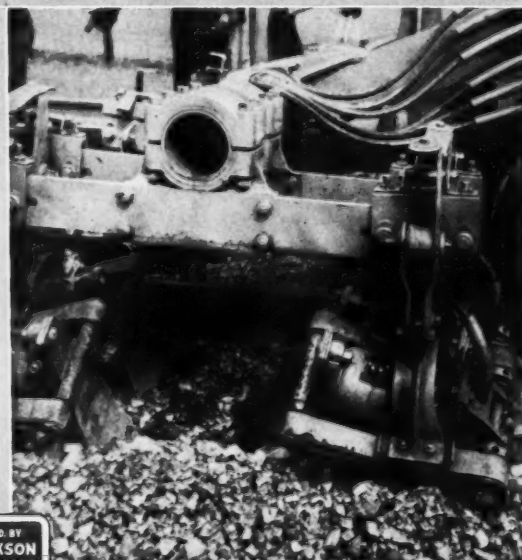
... long ago established a standard of uniformity and excellence of tie tamping which remains unmatched today.

Moreover, in any ballast and in any lift, from that which is slightly lower than the average size of the ballast to the very highest, Jackson Multiple Tie Tampers will put up perfect track at less cost than can be achieved by any other means.

These are facts which you can verify on your own line. We will be glad to place a Jackson Multiple with you on a rental basis, with rental to apply on optional purchase.



RIGHT UNDER THE RAIL



WAY UNDER THE TIE



Sold in U.S.A. by ELECTRIC TAMPER & EQUIPMENT CO. Ludington, Mich.

**With This Great New Foliage Spray
You Know Where You're Going Because
*You Can See Where You've Been***



Courtesy of R. H. Bogle Company

WEEDONE[®] BRUSH KILLER 977

- 1.** Gives sprayed brush a whitewashed appearance, helps the operator get complete coverage . . . to eliminate "skips."
- 2.** The first brush killer designed for spraying in an oil-water carrier on utility rights-of-way.
- 3.** More effective on many hard-to-kill species.

Write for the Weedone Brush Killer 977 Folder

AMERICAN CHEMICAL PAINT COMPANY, AMBLER, PA.

AGRICULTURAL CHEMICALS DIVISION • Originators of 2,4-D and 2,4,5-T Weed Killers

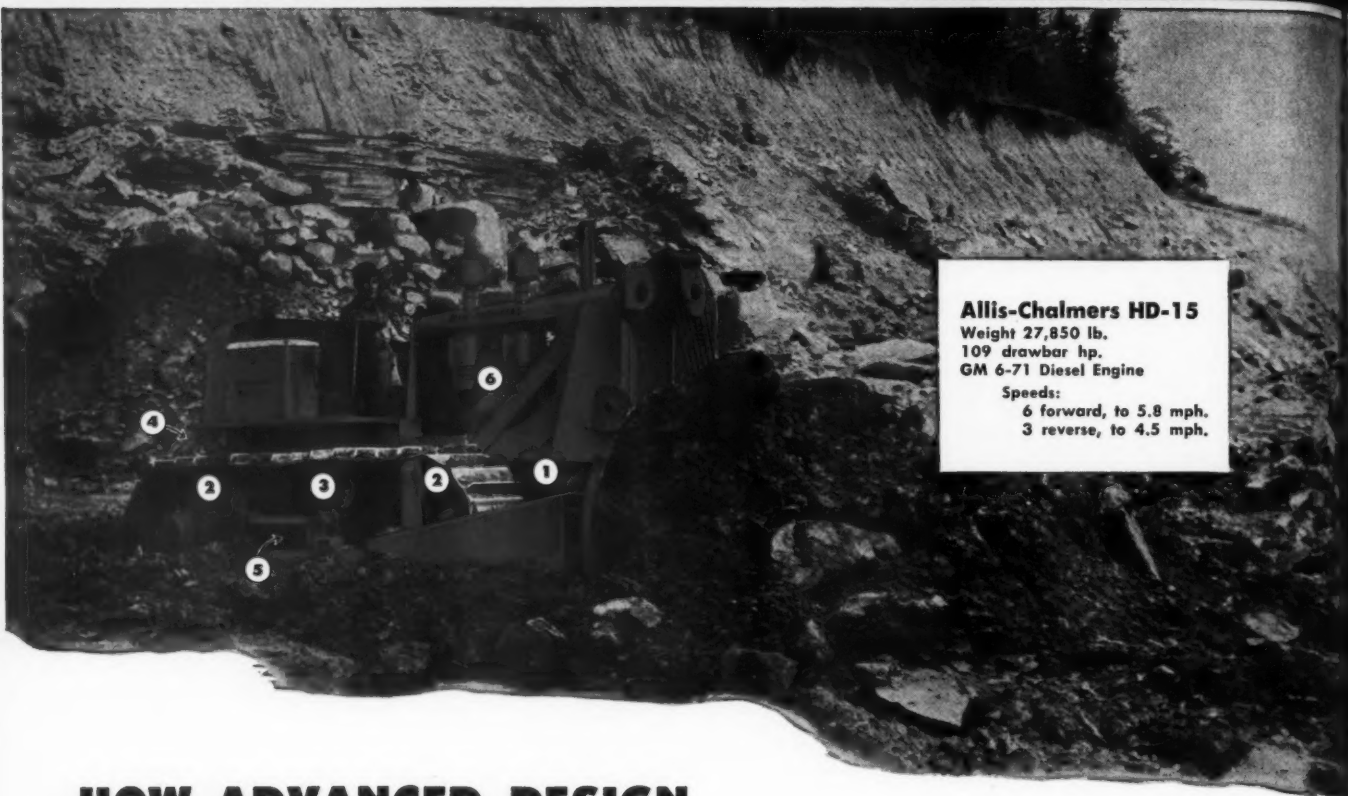


RAILWAY TRACK and STRUCTURES

For additional information, use postcard, pages 677-678

JULY, 1953

615



Allis-Chalmers HD-15

Weight 27,850 lb.
109 drawbar hp.
GM 6-71 Diesel Engine

Speeds:

6 forward, to 5.8 mph.
3 reverse, to 4.5 mph.

HOW ADVANCED DESIGN

Makes Allis-Chalmers Tractors more dependable for off-track work

These heavy-duty tractors have toughness and ease of servicing to match their outstanding performance ability. Here are some of the advanced design features that provide extra strength and protection — keep Allis-Chalmers tractors on the job more hours:

1. One-Piece, All-Welded Structural Main Frame . . . strong and firm without a single ounce of excess weight — absorbs all vertical and horizontal stresses.

2. Extra Large Idler and Sprocket eliminates rocking action, puts more track on the ground for greater stability and better traction.

3. Spring-Loaded, Positive Seal keeps dirt, moisture and grime from damaging truck wheels, idlers and support rollers . . . you lubricate them only once every 1,000 hours.

4. All-Steel, Welded A-Frame Track Stabilizer permits free track oscillation, yet keeps tracks rigidly in line and absorbs thrusts and twists from shock loads and working on uneven terrain.

5. Oil Enclosed Track Release Mechanism reduces track maintenance and breakage. An adjustable screw lock provides positive holding action that maintains adjustment at required setting.

6. Engine Not Used as Structural Member — no strain is transmitted to it. Engine weighs less per horsepower developed, because of 2-cycle design — has modern unit injection.

UNIT CONSTRUCTION SAVES SERVICE TIME

With Allis-Chalmers *unit construction*, major assemblies are easily removed without disturbing related assemblies. This brings real savings in time and money, puts tractors back to work faster. It assures better inspection and maintenance, too. Servicemen find it easy to remove major parts to correct trouble before damage develops.

Let your dealer tell you more about the toughness of Allis-Chalmers tractors, their time-saving unit construction — and their unequalled lugability and work power.

ALLIS-CHALMERS

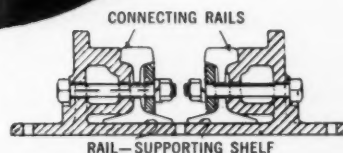
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

4 JUMPS AHEAD OF COMPETITION...

Yes, the Universal Frog for yard service is built better 4 ways . . .

- 1 It is made of an alloy electric cast steel that adapts itself to low cost electric or oxy-acetylene welding in track or shop.
- 2 Tie plates are cast integral with the Universal Frog—an exclusive!
- 3 Rail supports are cast integral on both ends of the Universal Frog—another exclusive!
- 4 One-piece construction—no loose joints. Eliminates extra parts and cuts down maintenance costs.

THE UNIVERSAL FROG

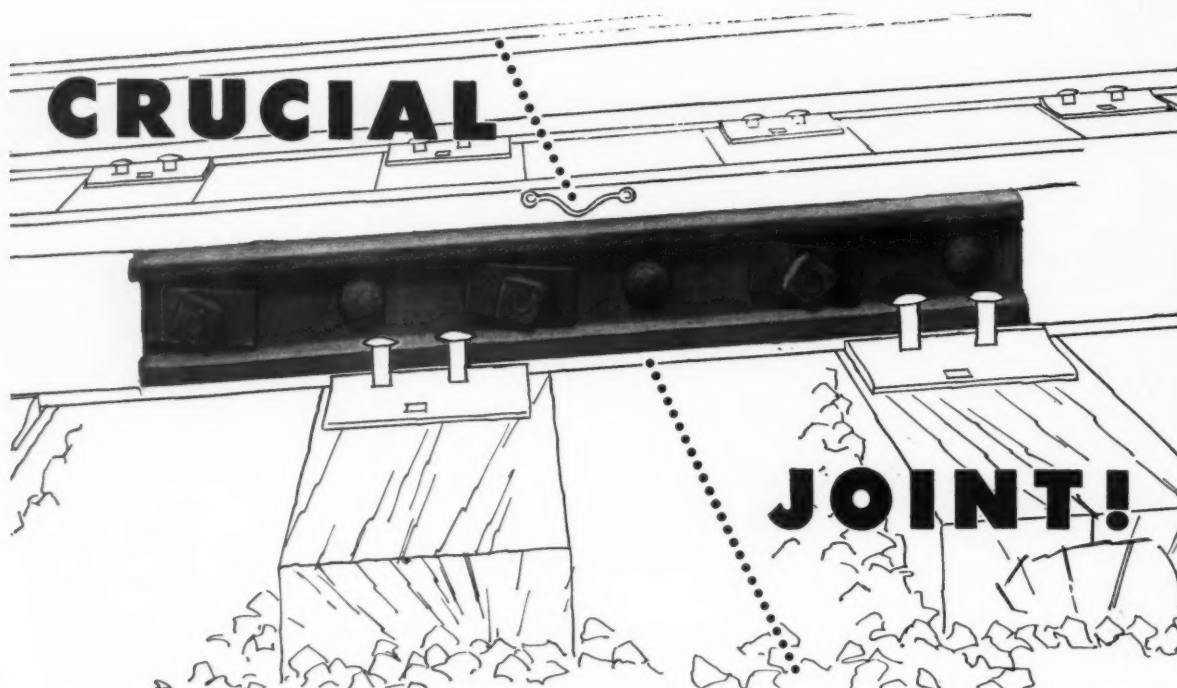


HERE'S PROOF: Compare the cross sections of the Universal Frog with conventional types. Note the improved type rail joints, the patented supporting shelf, integral tie plates and rib construction.



THE L.F.M. COMPANY

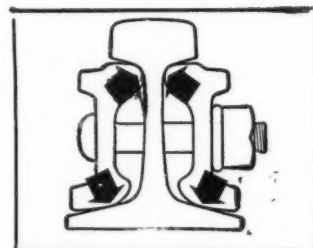
ATCHISON, KANSAS—MAIN OFFICES & PLANT
NEW YORK CITY • CHICAGO, ILL.



Protect rail joints with NO-OX-ID "A Special"

Every rail joint along the way is a crucial one. That's why it is so important that correct materials be selected to protect them.

NO-OX-ID "A Special" is a rust preventive particularly suited for this purpose. Its weathering properties insure a long service life, which, in turn, provides lubrication and protection to prevent freezing of the rail joint and minimize wearing of the joint bar. Easily and quickly applied, it meets all phases of the job condition. Straight, smooth track with the finest riding qualities is assured. Rail boards, also, are best protected with NO-OX-ID "A Special."



NO-OX-ID "A SPECIAL" PREVENTS "FREEZING"

Arrows mark the fishing areas where non-oxidizing NO-OX-ID "A Special" prevents joint bars from freezing while protecting the metal against corrosion, resulting in added years of service.

WRITE FOR BULLETIN

Your copy of "How to Protect Rail Joints Using NO-OX-ID," including application methods, will be sent on request.

Dearborn

DEARBORN CHEMICAL COMPANY
MERCHANDISE MART PLAZA
CHICAGO 54, ILLINOIS

**THE ORIGINAL
RUST PREVENTIVE**

NO-OX-ID



WEED PROBLEM



... Ended with CMU

Powerful Du Pont **CMU** kills weeds and grass and prevents regrowth



Save labor and simplify the job of keeping weeds down . . . with Du Pont CMU. As little as 1 to 1½ pounds per 1000 square feet . . . 40 or 60 pounds per acre . . . can get rid of weeds and grass for an entire growing season or longer. It gives you new long-lasting efficiency in cutting down fire and maintenance problems caused by unwanted vegetation. Use Du Pont CMU around sidings, track, switches, culverts, bridges, fences and railyards.

- Kills most kinds of weeds and grass and prevents regrowth. It works through the roots . . . just spray it on the ground.

- Eliminates fire hazards caused by unwanted vegetation.

- Saves work. One spray with CMU takes the place of repeated hand cutting, mowing, or other less effective means.

- Cuts maintenance. Prevents weeds from fouling up machinery and causing it to rust, keeps the way clear for outdoor work of any kind. Destroys cover for rodents and other vermin.

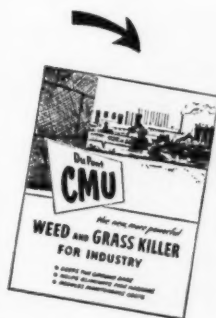
- Non-flammable, non-volatile, non-corrosive. Comes as a wettable powder to mix with water.

**TO GET THIS BOOKLET
SHOWING RESULTS WITH
CMU, fill in coupon at right.**



REG. U.S. PAT. OFF.

**BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY**



E. I. du Pont de Nemours & Co. (Inc.)
Grasselli Chemicals Department
Wilmington, Delaware

B-7

Name

Firm

Street

City State

RAILWAY TRACK and STRUCTURES

For additional information, use postcard, pages 677-678

JULY, 1953 619

TIRES VS CRAWLERS

**There's a big difference in
PERFORMANCE AND COST
on off-track work**

**Rolling on
4 rubber-tired
anti-friction wheels
LeTourneau units
provide:**

**Driving through
an assembly of
over 500 wearing parts
crawler-tractors
give:**

1
Free-rolling speeds . . . 19 mph with Tournatractor; 28 mph with Tournapulls. Power transmitted through anti-friction bearings.

High friction and drag, slow forward and reverse speeds (2 to 7 mph). Slow shift with loss of momentum and slow acceleration.

2
"Go-anywhere mobility" . . . drive on any assignment over highways, country, along right-of-way, on tracks without damage.

Hauled by trailer or work train 500 yds. to job with delays for loading, unloading. Can't cross high or tracks without planking.

D TOURNAPULL 122 hp, 28 mph, 7-yd. Scraper



Working in confined areas is made easy by "D's" multi-disc air brakes, plus ability to turn 90° right or left in 12'8" radius.

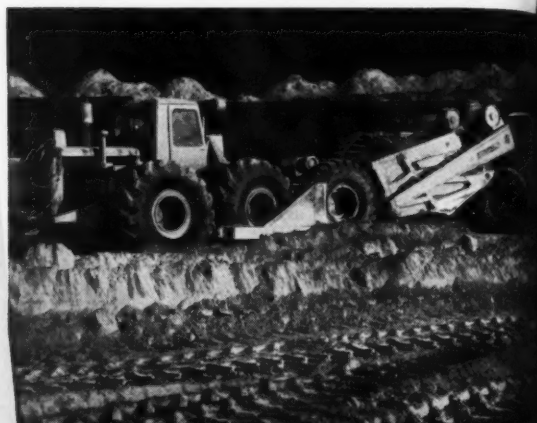


Self-loads ballast, gravel, cinders. In slippery going, wheel on firmest footing has 4 times the power of other drive-wheel.



Bowl is unloaded in seconds . . . load can be spread in smooth, controlled layers, piled. Big rubber tires help compact fill.

Tournatractor push-loads Scrapers . . . handles variety of work 2 times faster than crawler-tractors.



TOURNATRACTOR 186

ing and grading for spur lines. Tournatractor goes anywhere, handles any tractor completes more miles at less cost.

Tires straddle rails for emergency switching or spotting. (Unit is pushing these loaded cars up slight grade).

In winter, Tournatractor clears snow from yards, crossings. Its mobility frees engine snow plows for mainline plowing.



186 hp, 19 mph, 8 mph reverse

(mounts all standard tractor attachments)

... drive on long-lasting rubber-tired wheels as simple and maintenance-free as those of truck or car.

... 500 wearing parts in track operating, but constantly in grinding dirt, require regular replacement.

Giant low-pressure tires which absorb shocks, reduce jarring of machine parts, as well as operator.

Rigid track assembly, with constant jolt and shock to machine and operator on any kind of surface.

Tires flex for self-cleaning in gumbo. You have no delays to dig out mud, no power loss.

Cleats pick up gumbo, rollers and track assembly gum up, and mud acts as a dragging brake, robbing power.

(8' dozer, 9' V-plow available)

Consider these advantages of rubber tires over crawlers next time you're in the market for off-track equipment. Call us . . . we'll be glad to talk them over with you.

Tournapull—Trademark Reg. U.S. Pat. Off. Tournatractor—Trademark DPD-266-RR

LeTourneau-Westinghouse Co.

PEORIA, ILLINOIS

Tell us more about ☐ 7-yd. 122 hp D Tournapull ☐ 19 mph 186 hp Tournatractor

NAME _____

TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____

☐ Would like to have demonstration on our line.



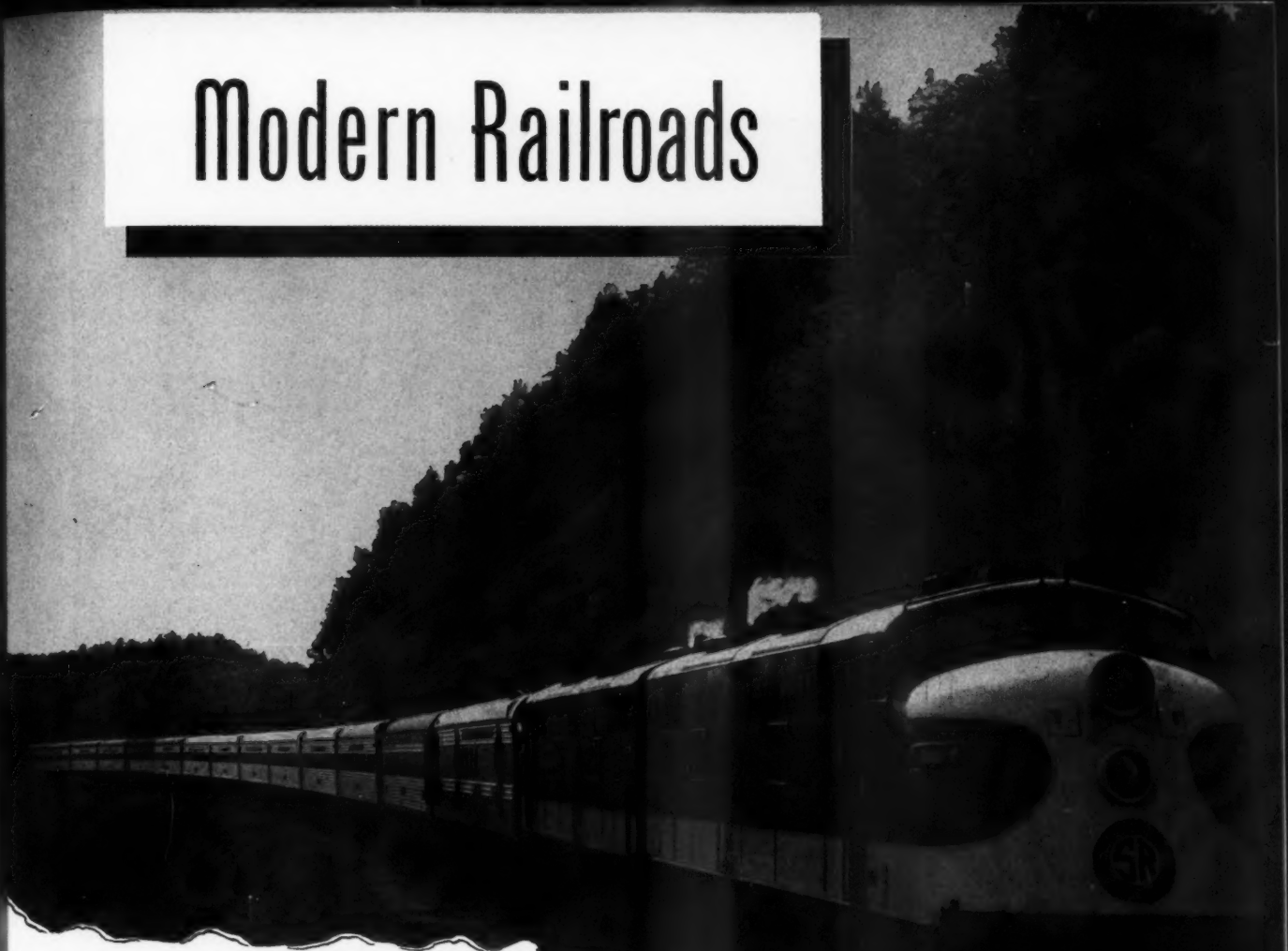
... load ... layers ... compact fill ... Tournapull takes shortest route between jobs ... travels via highway or right-of-way at speeds up to 28 mph.

*The Best
Rail Joints.*

*are Always the
Most Economical*

THE RAIL JOINT COMPANY Inc.
50 CHURCH ST. NEW YORK 7, N. Y.

Modern Railroads



"The Crescent," streamlined deluxe train of the Southern Railway—one of the modern railroads served by The Nalco System. Photo courtesy of the Southern Railway System.

utilize MODERN *Nalco* MATERIALS and SERVICES

"THE Southern Serves the South"—and Nalco serves the Southern. It is a great satisfaction to have had, and to continue to have a small part in the excellent modernization and performance record of the Southern Railway System.

During the past year, thirteen different Nalco formulas were in use by the Southern. These included several different internal boiler water treatment materials, feedwater stabilizers, stationary boiler feedwater treatments, diesel cooling water treatment, and diesel steam generator treatment . . . all modern Nalco materials, backed by Nalco service to insure best field results.

NATIONAL ALUMINATE CORPORATION
6196 West 66th Place Chicago 38, Illinois
In Canada: Alchem Limited, Burlington, Ontario

THE

Nalco[®]

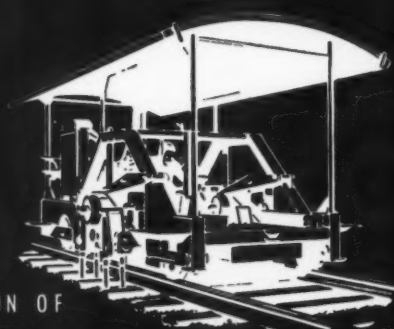
SYSTEM . . . Serving Railroads through Practical Applied Science

SERVICE...

ANOTHER ADVANTAGE OF "THE NEW STANDARD OF TRACK MAINTENANCE"

The modern *Matisa* "Pressure-Persuasion" tamping principle is easily proved to be the most effective . . . there can be no doubt when you **PULL A TIE AND SEE!**

Matisa **FOLLOWS THROUGH, TOO! . . .** with fast, immediate availability on all parts and service.



RECOGNITION OF

SUPERIORITY PUT *Matisa* IN THE LEAD IN '52!

THE MATISA EQUIPMENT CORP. • 224 S. MICHIGAN AVE. • CHICAGO 4

TRACKWORK SPECIALISTS ALL OVER THE WORLD



NEWS NOTES...

JULY 1953

...a resumé of current events throughout the railroad world

Demands for more favorable arrangements with respect to vacations, holidays, health benefits, and pass privileges have been served on the railroads by 15 unions representing non-operating employees. No change in wage rates is proposed because the moratorium in present wage agreements runs until October 1 this year.

The Interstate Commerce Commission has found that the work of Rock Island roadmasters, master carpenters, signal supervisors, and comparable employees is within the scope of outstanding commission orders defining work of "employees or subordinate officials" of railroads. The effect of the finding is to bring these supervisory employees within the scope of the Railway Labor Act.

A new and faster sleeping-car service between New York and Los Angeles will be inaugurated by the New York Central, the Chicago & North Western and the Union Pacific about August 1. West of Chicago the sleepers will be operated on the C&NW-UP streamliner "City of Los Angeles" which will enable a five-hour reduction in overall running time.

Ever since the Transportation Act of 1920 was passed, railroad earnings have been "below 4 per cent, which no one can consider equal to a fair return," but the Interstate Commerce Commission has never "initiated rates to improve the return." This statement was made by Secretary of Commerce Sinclair Weeks in a recent address. His further statement to the effect that "from here on out every group in our economy is going to get a fair break," may be interpreted as a straw in the wind forecasting a possible change in attitude in Washington towards the railroads.

The Southern will build a new freight yard at Chattanooga, Tenn., at an approximate cost of \$14 million. The new facility will be comparable in every respect to the road's car-retarder yards at Knoxville, Tenn., and Birmingham, Ala., and in addition will include innovations devised since those yards were placed in service.

The possibility that better service may enable the railroads to recapture a substantial amount of lost l.c.l. traffic is indicated by the experience of the Union Pacific. Within a month of establishing a new overnight service between Los Angeles and Las Vegas, Nev., this railroad experienced a fourfold increase in l.c.l. traffic between those points.

Class I railroads in the first four months of this year had an estimated net income, after interest and rentals, of \$264 million, according to the Bureau of Railway Economics of the Association of American Railroads. This represented a substantial increase as compared with the income of \$197 million for the first four months of 1952.

NEWS NOTES (continued)

A new concept of coach-travel service is behind the development by the Budd Company of an entirely different type of rail coach, called the "Siesta Coach." The car provides individual room-type accommodations with cot-size beds and private toilet and washing facilities for 40 passengers. The purpose is to provide improved standards of comfort and privacy for long-distance coach passengers at lowest possible fares.

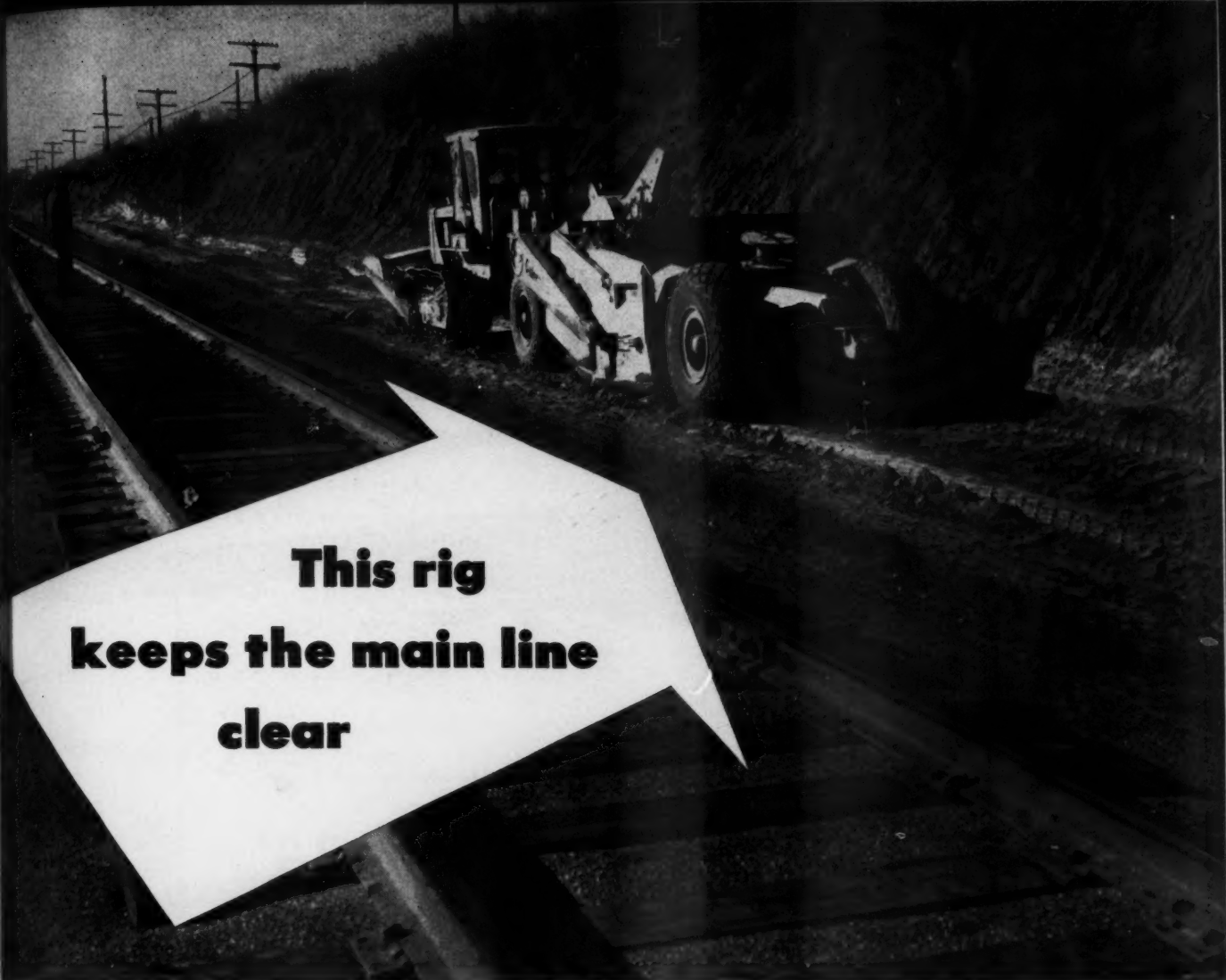
A bill designed to assure prompt increases in railroad rates as costs rise has been reported favorably to the Senate by its Committee on Interstate and Foreign Commerce. In recommending passage of the so-called "time-lag" bill, the committee stated that the "depressed earnings" and "unsatisfactory financial condition" of the railroads in the postwar period have been due "primarily to the wide spread between the increases in the operating expenses of the railroads, and the lesser and much later increases which they have been permitted to make in the prices at which they are allowed to sell their services.

On May 1 the number of serviceable cars owned by railroads and their car-line affiliates was 7,423 in excess of the total a year earlier—1,752,800 cars compared with 1,745,377 cars. During the same period total ownership of cars had risen only 4,541, but the bad order total had dropped by 2,882 cars. These figures were issued by Arthur H. Gass, chairman of the Car Service Division, Association of American Railroads.

A completely new system for handling highway truck trailers "piggy-back" style on railroad flat cars has been developed by the Pullman-Standard Car Manufacturing Company. Outstanding feature: It permits side loading and unloading of truck trailers, enabling the important trailers to be loaded last and unloaded first.

A new type spring, which uses air as a cushion, and which looks something like a rubber life raft, has been developed for use on railroad freight and passenger cars by the General Tire & Rubber Co., assisted by engineers of the Timken Company. This air cushion would replace the conventional steel-spring suspension system in the trucks. Reports are that preliminary test results have been extremely encouraging.

ALSO WORTH NOTING—Class I railroads incurred diner and buffet-car expenses of \$1.374 for every \$1 of diner and buffet revenue collected in 1952, according to figures compiled by the Bureau of Transportation Economics and Statistics, Interstate Commerce Commission . . . The Erie has received a special citation from the Public Health Service for being the first major railroad whose dining cars won Certificates of Sanitation under the inspection program sponsored by the P.H.S. and the railroads . . . Fifteen eastern railroads, encouraged by public response to specially reduced roundtrip ticket bargains established last year, will extend their "group economy fares" and "family plan" savings to December 1953.



**This rig
keeps the main line
clear**

The Chicago, Rock Island & Pacific ran into a tough problem on this railroad cut near Hutchinson, Kansas. Ditches had to be opened alongside the cut, but hauling the sand and clay out on railroad cars would tie up a long stretch of main line. So the C.R.I. & P. called in one of its Caterpillar teams—a D6 Diesel Tractor with No. 60 Scraper.

Hauling 7 cu. yds. struck or 9 heaped, this rugged yellow scraper handled two loads an hour, going a tough 1½-mile round trip. And the main line stayed clear for payload traffic.

The No. 60 Scraper is cable-operated for easy control of depth of cut and spread. And positive forced ejection sweeps the smooth-walled scraper bowl clean of the

stickiest material. Special high-tensile steels in all highly stressed structural members keep dead weight down and put extra years of service into these durable earthmovers. The push block is located well back of the tires so a push tractor can add plenty of in-line power. And the scraper's low center of gravity and giant low-pressure tires keep it stable on the roughest terrain.

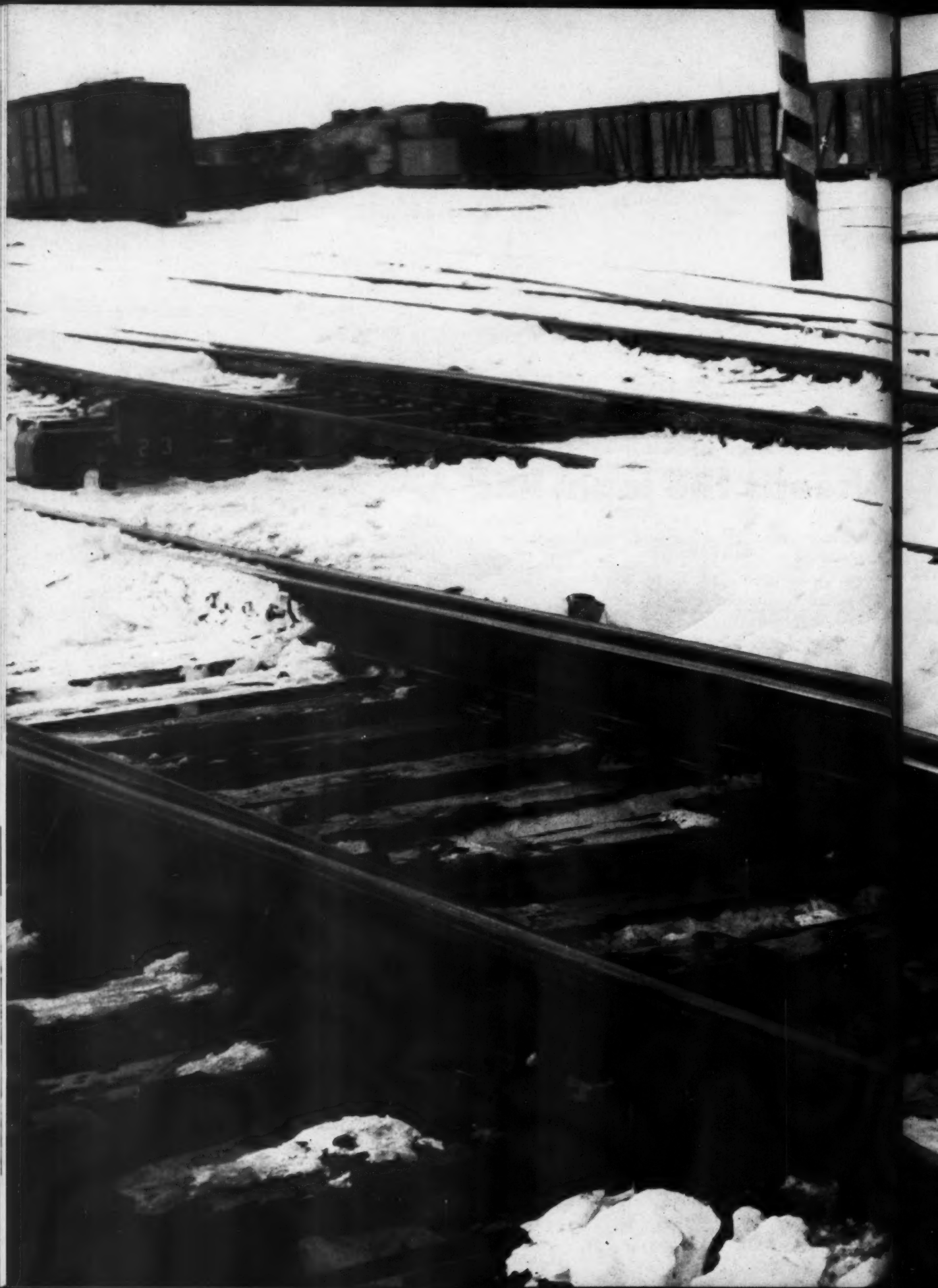
Your Caterpillar Dealer will be glad to demonstrate Cat Scrapers for you. There are 9 sizes, heaped capacities from 4½ to 27 cu. yds. without extensions. And remember, only genuine Caterpillar parts can guarantee you the genuine Caterpillar quality that's built into every one of these big yellow machines.

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CATERPILLAR

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TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT**





Guard against ice-bound switches with fast-acting G-E snowmelters

You can keep switches operating during the worst winter weather with a General Electric snowmelting system. The heart of this system is the Calrod* heating unit which is attached to stockrails at switchpoints.

When a storm approaches, remote-controlled G-E snowmelters distribute safer, even heat at these vital points without danger of burning ties or rolling stock. G-E flameless snowmelters cost only a few cents per hour per switch, are ready to start working when and where you need them, and require little maintenance.

Plan now for your winter snowmelting needs. Before you submit your 1954 budget, ask your General Electric representative for the full details on G-E snowmelting systems. General Electric Company, Schenectady 5, N. Y.

*Reg. Trade-mark of General Electric Company
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You can put your confidence in—

GENERAL  ELECTRIC



"He never was much for letter-writing when he was in college. But he must know how anxious Mother and I are . . . now that he's off in Korea. Haven't heard from him in six weeks. Of course, they say 'no news is good news' . . . but I wonder. Maybe he can't write . . . because . . . maybe he's in a hospital somewhere. And maybe he needs blood. I don't know . . . but

I'm not taking any chances. That's why I'm giving blood."

★ ★ ★

Yes, all kinds of people give blood—for all kinds of reasons. But whatever your reason, this you can be sure of: Whether your blood goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Give Blood Now
CALL YOUR RED CROSS TODAY!
NATIONAL BLOOD PROGRAM



Business Executives!

✓ Check These Questions!

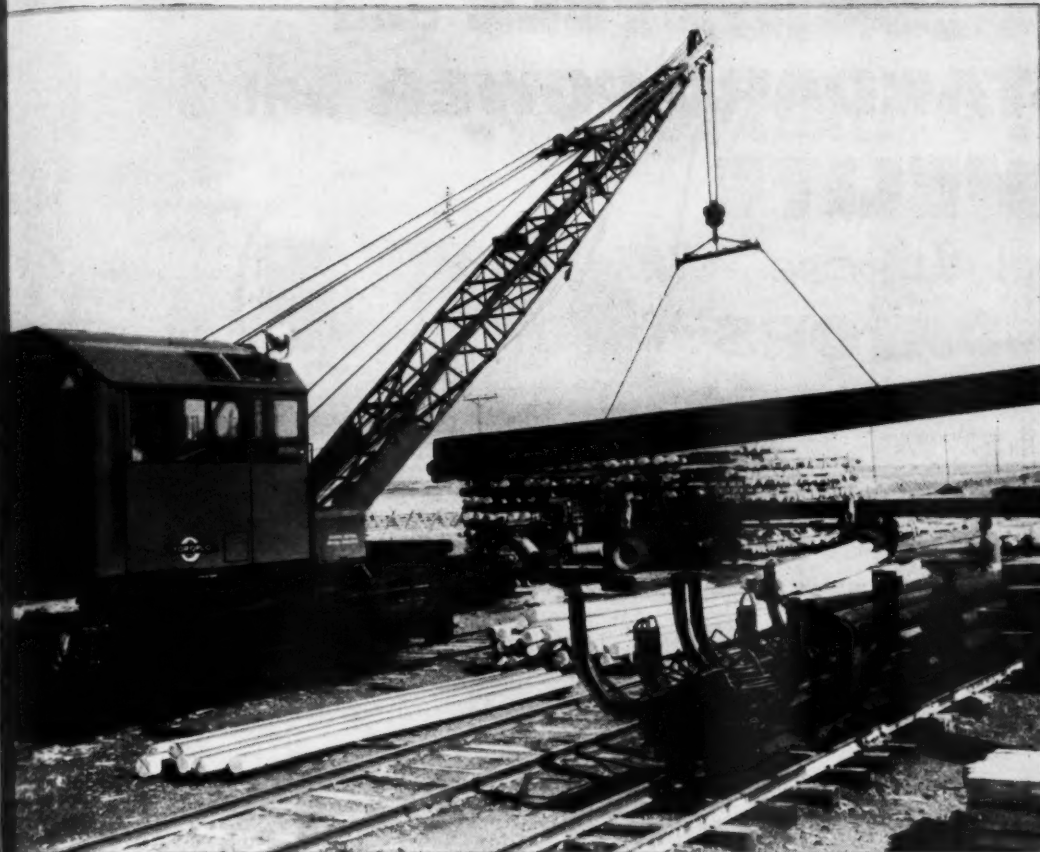
If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of cooperation?
- ☐ Was information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a single pint of blood may mean the difference between life and death for any American . . . the need for blood is urgent!

This BROWNING 25-Ton Diesel TorQflo locomotive crane unloads and stockpiles poles on one of its many jobs for a transcontinental railroad. The Browning operates as a locomotive with ample power for car switching, handles all the heavy crane jobs in the yard or on the line.

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BROWNING'S
on these jobs**



Browning builds the only complete line of heavy-materials handling cranes

● If it's crane work there's a Browning built to do it . . . efficiently, economically and dependably. That's because Browning models are designed to do specific jobs for specific industries—and they're built to *stay* on the job.

Browning's half-century of specialized experience devoted exclusively to crane manufacturing, and Browning's well-known rugged design and construction are your best assurance that you can't go wrong with a Browning on the job.

Write for complete specifications on the Browning model designed for your job.

WAGON CRANES
2 Models
17½ to 25 Tons
25 to 100 Ft.
Booms



TRUCK CRANES
5 Models
8 to 30 Tons
25 to 120 Ft.
Booms



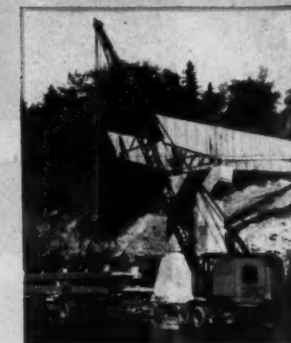
LOCOMOTIVE CRANES
3 Models
25 to 50 Tons
50 to 135 Ft.
Booms



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STOCK PILING MATERIALS



BRIDGE CONSTRUCTION



HEAVY FREIGHT HANDLING

THE BROWNING CRANE & SHOVEL CO.

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BROWNING

LOCOMOTIVE, WAGON
TRUCK AND CRAWLER

Cranes

YOU GET BOTH

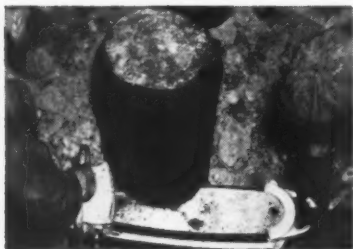
HIGH-CYCLE and

STANDARD POWER with

HOMELITE

Dual-Purpose

GENERATORS



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Carryable Pumps • Generators
Blowers • Chain Saws



To give a maintenance crew all the time-saving, cost-cutting advantages of power tool operation, a Homelite Dual Purpose Generator is the simplest, most satisfactory solution.

It's the simplest because this lightweight carryable generator can be put into action quickly and easily any place on the road . . . even on bridges . . . with no need for long, hazardous and power consuming cables. And it's the

most satisfactory because with this one generator you can operate not only floodlights and standard universal tools, but also the new, increasingly popular high cycle power tools.

That's right! With this generator you don't have to choose between standard tools and high cycle tools. You operate *both*. You operate any kind . . . *every kind* . . . of hand power tools available to you today.

Look into it. See it in action. Write for free demonstration.

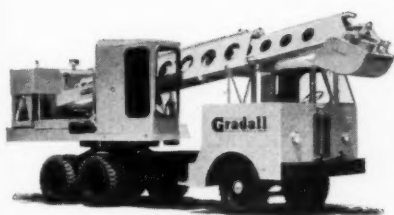
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SERVICE

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Give your maintenance and construction work the

HIGHBALL



with a **GRADALL**

YES, railroads have *proved* you can do these jobs—and many more—*faster, better, at less cost* with a Gradall!

It speeds jobs like track or ditch cleaning. One Gradall does them faster than a crew of as many as 50 men.

Gradall does your jobs better, too. Its telescoping *arm-action* boom gives the operator such complete control of the tool he can work even to hand-finish "specs".

And Gradall moves fast from job to job—at truck speed. It gets into, and works out of, places completely inaccessible to any other machine. Or, drive it onto a flat car and it becomes part of your work train.

It pays for itself fast, too! A single investment gives you a machine that does the work of several. It carries its own quickly interchangeable attachments—always ready for the "next job", always busy.

But prove it yourself. Your Gradall Distributor will show you with a field demonstration how the multi-purpose Gradall can cut costs, speed completion of your work.

**Now one machine
does all these jobs**

- *Cleaning tracks and roadbeds*
- *Trenching and Backfilling*
- *Maintaining drainage ditches*
- *Widening cuts and fills*
- *Ripping old pavement*
- *Sloping and Grading*
- *Excavating*
- *Laying rails*



◀ In these cramped quarters Gradall cleans right up to ties, digs drainage ditch, and dresses slope, swinging around to load spoil in truck ahead of machine.

**Gradall Distributors in over 75 principal cities
in the United States and Canada**



YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

RAILWAY TRACK and STRUCTURES

For additional information, use postcard, pages 677-678

JULY, 1953 633

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...of track and bridge work

by using labor more efficiently. Keep your section hands busy more of the time with Gardner-Denver Pneumatic Tools that are idle less time because they need less maintenance.

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rock drills
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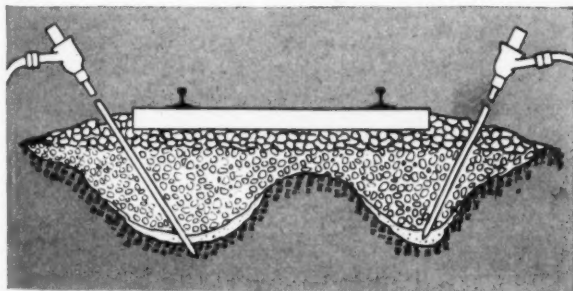


KOEHRING 14.4 m.p.h. RAILAID

works on and off-track



3 LARGER SIZE Koehring excavators have dipper capacities up to 2½ yards . . . lift capacities up to 79½ tons. Heavy-duty ¾-yard 304 (above) safely lifts 13.9 tons on crawlers . . . 25 tons on rubber-tired truck or cruiser mounting. Reserve strength helps protect heavy work schedules against costly down time.



RAILROAD MUD-JACK® . . . Water or ballast pockets in track sub-grade are easily corrected with Koehring Mud-Jack. Injection points are driven below ballast . . . hydraulic pump forces soil-cement slurry into weakened area, stabilizing existing material. Leaves firm sub-grade. Saves labor, reduces "slow orders". Send for Mud-Jack bulletin.

To save you the extra cost of separate on and off-track cranes, Koehring RailAid combines all the advantages of a self-propelled track crane with the versatility of a standard crawler crane. It is self-powered through extended lower traction shaft of crane and universal coupling on rail propulsion car . . . travels forward and reverse at 4 rail speeds up to 14.4 m.p.h.

RailAid loads or unloads itself on ramp-equipped propulsion car in less than 10 minutes . . . sets car on and off-track . . . clears the track for normal traffic. Work of crane and the road crew is uninterrupted for the complete shift. Crane lifts 6.6 tons from car, 8¼ tons from ground . . . loads, unloads rails in yards and along the line, lays rails, places timbers and trusses on bridge construction and repairs, speeds scrap handling and salvage. Standard 30-ft. boom extends to 50 feet . . . readily converts to magnet crane, clamshell, dragline, pile-driver, ½-yd. shovel or hoe.

Full details on Koehring RailAid are covered in fact-packed bulletin . . . write us for your copy.



KOEHRING

COMPANY, Milwaukee 16, Wis.

(Subsidiaries: JOHNSON • PARSONS • KWK-MEX)

**WHAT
BUCYRUS-ERIE
SMOOTH
CONTROL**

**MEANS
ON
RAILROAD
JOBS**

The smooth control of Bucyrus-Erie excavators and cranes combines pinpoint accuracy with fast operating cycles. This saves you money on routine jobs, like track maintenance, bridge construction, excavating and yard work. But perhaps most important, it saves you *time* on emergency assignments such as clearing landslides and washouts.

Bucyrus-Erie controls are direct-connected so operators can "feel" their work accurately. Lever pressures are low and all controls are within convenient reach without stretching or straining. Whether it's a delicate job like setting structural steel or straight excavating, operators enjoy full-command of the boom — can deliver high-speed work throughout an entire shift.

If your division requires an excavator with smooth control, that works at peak efficiency on *any* job, see your Bucyrus-Erie Distributor. He has the machine that will fill your needs best.

67E53

**BUCYRUS
ERIE**

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin



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on **CUMMINS**®



CUMMINS DIESELS

are engineered to make light work of tough jobs

Why do so many railroad men count on Cummins for dependable power in toughest going?

You'll find part of the answer in the special kind of versatility that belongs to Cummins Diesels alone. It's versatility that goes beyond the handling of all kinds of jobs. It's actually an ability to meet every power requirement that any situation demands . . . to save on fuel, do more work per dollar, whether the call is for continuous power or stop-and-go operation over a wide and flexible speed range.

Yes, you can count on a (60-600 h.p.) Cummins Diesel for dynamic versatility in every job—performance that stems from an exclusive fuel system and precision engineering. See your Cummins dealer for all the facts. He's a diesel specialist . . . ready to solve your power problems.

CUMMINS ENGINE COMPANY, INC., Columbus, Indiana

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Leaders in rugged, lightweight, high-speed diesel power!

RAILWAY TRACK and STRUCTURES

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JULY, 1953

637

FASTER, RAIL JOINT MAINTENANCE AT LOWER COST, WITH THE WOOLERY POWER BOLT TIGHTENER

HERE'S THE ANSWER to fast, periodic maintenance of rail joints! The Woolery Power Bolt Tightener assures uniform tightness to every bolt through automatic torque release. Chuck rotation can be reversed immediately. Wheels permit quick set-off for train clearance.



Woolery SINCE 1917 RAILWAY MAINTENANCE EQUIPMENT
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Exclusive Export Representatives

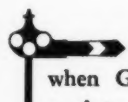
PRESSED STEEL CAR CO., NEW YORK, N. Y.

Increased efficiency . . . lower cost . . . for tightening or replacement . . . adjustable tension . . . ample power . . . send for Bulletin #192.

SINCE 1917 manufacturers of Tie Cutters, Tie End Removers, Tie End Trimmers, Power Bolt Tighteners, Spike Drivers, Motor Cars, Push Cars, Tool Transporters, Weed Burners, Extinguisher Cars, Chemical Sprayers, Tie Plate Spacers, Creosote Tie Sprayers, Rail Nippers, Flangeway Cleaners, Rail Joint Oilers, Power Joint Lubricators.

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 Snow, gravel, dirt and rubbish get a fast heave-ho when Great Northern R.R.'s Model HM "PAYLOADERS" go into action. And these 1½ cu. yd. tractor-shovels can walk across tracks and go almost anywhere, thanks to their 4-wheel-drive, large pneumatic tires and proper weight distribution. They also have power-assisted steer, full hydraulic bucket control and four speeds in *both* directions — ranging from a slow, powerful crawl up to 20 miles per hour travel speed.

"PAYLOADERS" dig, grade, load, carry, backfill and spread dirt and bulk materials on right-of-way work . . . and make themselves valuable all year 'round at terminals, yards and stations. It will pay *you* to join the swing to "PAYLOADER" tractor-shovels. There are sizes to fit *your* requirements in the seven available models, and there are 200 "PAYLOADER" Distributors in the U.S. and Canada, with the finest of parts and service facilities to keep your "PAYLOADER" equipment profitably busy. The Frank G. Hough Co., 751 Sunnyside Ave., Libertyville, Ill.

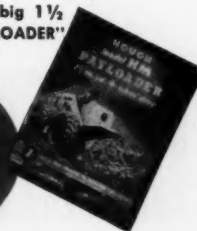


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fast to the job...
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SPREADER-DITCHER

Railroad men—a whole generation of them—know that Jordan Spreader-Ditchers are regular “eager beavers.” Your Jordan is the kind of willing worker that’s ready for all the work you can give it . . . any time . . . all the time. A Jordan’s down-time is either negligible or non-existent. When you’re ready, it’s ready. Emergency jobs? Sure. Right now; no conversion or warm-up time needed. Controls and adjustments are quick and easy to handle. When you have construction and roadbed maintenance problems—usual or unusual—rely on your Jordan Spreader-Ditcher. You’ll find it truly an “eager beaver.”

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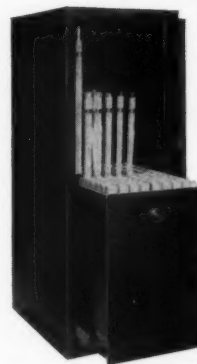
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FOR EVERY TRACK CAR**



Every Fairbanks-Morse demountable steel wheel conforms to one standard of quality — the highest!

Every step from sheet steel purchase to finished wheel is under Fairbanks-Morse control and inspection. Every wheel is cold-formed in our own plant, on our own presses using our own modern dies . . . machined and finished to a design of simplicity and strength.

This control of quality is your assurance that F-M wheels are the sturdiest track car wheels on the rails today!

When you need replacement wheels in 20", 16" or 14" sizes, standardize on quality . . . standardize on Fairbanks-Morse steel wheels for longer life. Fairbanks, Morse & Co., Chicago 5, Ill.

*Conform strictly
to AREA standards*



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No. 295 of a series

RAILWAY TRACK and STRUCTURES

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 WEST MONROE STREET
CHICAGO 3, ILL.

Subject: What's the Answer?

July 1, 1953

Dear Readers:

The sustained popularity of the What's the Answer? department of this magazine has a deep significance for us as we are sure it does for you. This department has been a regular feature since it was started in the January 1921 issue when the publication was known as the Railway Maintenance Engineer. During its entire existence it has been read as widely and intensively as any other part of the book. Comments from readers, as well as every study of readership we have made, indicate this to be true.

The explanation, it seems to us, is twofold.

For one thing, we are serving a field in which the techniques of procedure are constantly changing. The result is that new questions requiring answers are continually coming up. This point is brought out by the fact that our What's the Answer? department has asked more than 1400 separate questions with very little duplication.

The other part of the twofold explanation lies in what we believe to be the unusually inquisitive nature of the railway maintenance man. As we have often said before in this space, we are convinced that our readers as a group have an intensity of interest in their work that is matched by very few other similar groups in industry generally. This being the case, it is inevitable that a magazine feature giving answers to their day-to-day problems would capture and hold their interest.

To obtain and present the material for this department presents several knotty problems. For instance, the problem of finding out what subjects are uppermost in your minds from month to month is always before us. Also, we must keep in mind the fact that younger men are continually being added to the subscription list--men who have yet to ground themselves in all the fundamentals of railway maintenance practices. For the benefit of this group we must determine to what extent, and how often, it is desirable to raise questions on subjects that may be considered "old stuff" by veteran readers. However, we have been agreeably surprised from time to time to note that no matter how much experience the average maintenance man acquires he never seems to lose the desire to learn something new about old problems.

Many of you have on occasion told us of subjects you would like to have brought up for discussion in the What's the Answer? department. If you should think of one or more subjects when reading this letter why not scribble a note to us while the matter is fresh in mind?


Yours sincerely,

Merwin H. Dick

Editor

MHD:lw

Members: Audit Bureau of Circulations and Associated Business Publications



**No Snow
in 3 Seconds**

A NEW, EASY, SAFE AND ECONOMICAL WAY TO DEAL WITH SNOW-CLOGGED SWITCHES

Sharp, intermittent blasts of air blow the snow from switches in just a few seconds. That's how the new **RACOR SNOW-BLOWER*** works. *It's the easiest, safest, fastest and most economical way to clear snow from the space between switch points and stock rails to avoid delay and danger.*

The **RACOR SNOW-BLOWER** relieves the need for manual attention in bad weather, sav-

ing hours of time, labor and expense. It's easy to install, easy to maintain and operate. The **RACOR SNOW-BLOWER** is adaptable to remote control. It has been field-tested and proven during three winters under extreme snow conditions.

Let us figure on your next winter's requirements. Call our nearest representative for complete information about the **ECONOMICAL** new **RACOR SNOW-BLOWER**.

*Patent Applied For

**America's Most
Complete Line of
Track Specialties**

Brake Shoe

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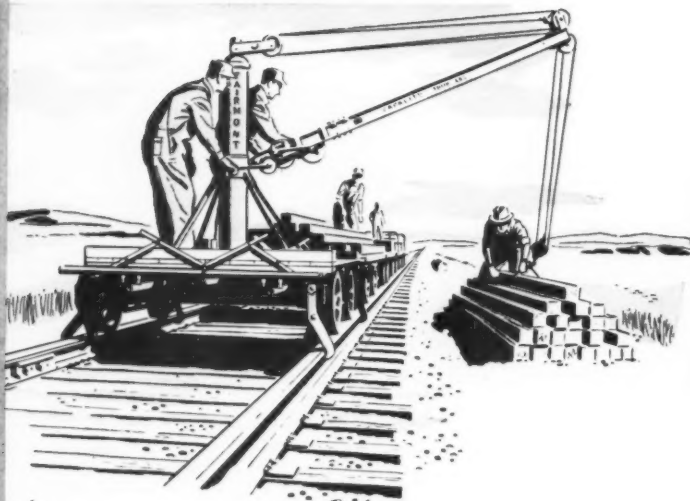


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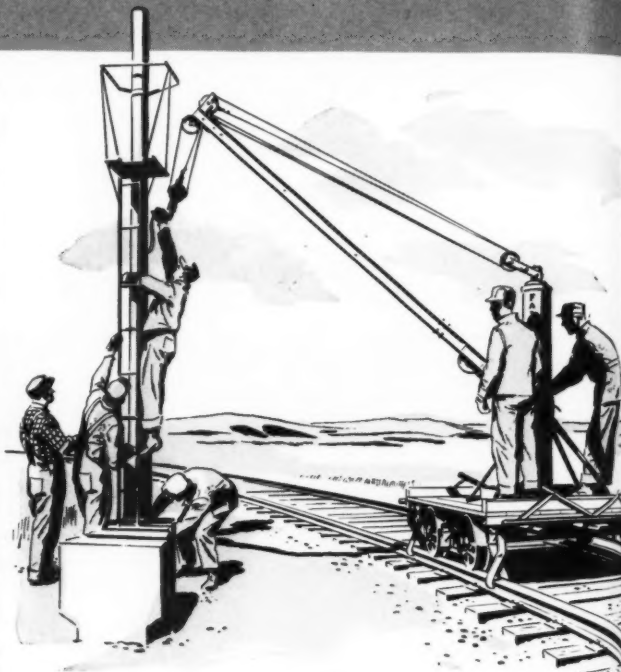
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The W63 Series A Derrick Car features an 8-ft. boom with 360° swing and two-speed operation for both load and boom cables. Especially useful in handling heavy timbers and stringers. Arranged for one or two man operation.



The W64 Series A Derrick Car with 13-ft. boom provides safe, easy and rapid handling of supplies and equipment up to 3000 lbs. Features full 360° pivot, two-speed hoist and boom cables. Can be operated by one or two men.

If there's a job to be done— there's a Fairmont to do it

**Performance
ON THE JOB
COUNTS**

Such is the variety of maintenance equipment manufactured by Fairmont—and such the versatility of each individual Fairmont product—that it would be difficult to conceive of a railway maintenance job that would not come within Fairmont's province. In the field of maintenance transportation alone, Fairmont makes available over seventeen different motor cars, ranging from single-man inspection cars to large gang cars designed for the heaviest hauling. The quality and character of these motor cars have brought them industry-wide recognition as the standard of operation everywhere—and the name they bear has come to be synonymous with sound

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Fairmont. So whatever your maintenance needs
always call on the world's largest manufacturer of
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You can rest assured that there's a Fairmont that
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"Eye-Appeal" for the Ballast Section

How important is it to have a ballast section that presents a uniform, well-dressed appearance, with even slopes and a well-defined toe line? As long as the ballast section conforms within reasonable limits to the standard of the particular road it will perform its function adequately; any refinements beyond this point are primarily in the interests of good house-keeping and attractiveness. That considerable importance is ascribed to these factors is indicated by the widespread practice of finish-dressing the ballast slopes and toe lines after the track has been raised and surfaced out of face.

In the days when track labor was relatively cheap it was frequently the practice to use toe boards for shaping the toe of the ballast in a straight line, an operation which literally involved placing the stones in position one by one. During the pinch of the depression a tendency developed to consider

this latter operation as somewhat of a frill.

It was during this state of affairs that the railroads began to place greater emphasis on the use of machines for shaping and dressing the ballast. Several roads devised equipment of their own design for this purpose, and additional manufacturers became interested in the problem. The result is that a variety of equipment is now available for doing an effective job of shaping and dressing the ballast section.

What this means is that it is now possible, with a minimum of hand work, to finish-dress ballast at only a fraction of what the cost would be if the work were done entirely by hand. If refinements in the ballast section were justified in the days when this work was done largely by hand there can be little doubt of the wisdom of continuing, or reinstating, this practice in these days of mechanization.

Highway Bridge Clearance Signs

The unsightly abrasions and scars on the low members of many of the highway underpass bridges bear mute testimony of collisions with high loads on highway vehicles. More to the point, some bridges have even been knocked loose from their anchorages.

There is not much more that can be done to help the forgetful driver in avoiding such accidents than to try to call his attention to restricted overhead clearances. The small signs seen posted on many underpass structures fail to do this adequately.

Some of these posted signs are so small that they cannot be read until too late for the driver to stop. Often the signs have figures and letters crowded into a space of about 20 ins. so that they are hardly perceptible.

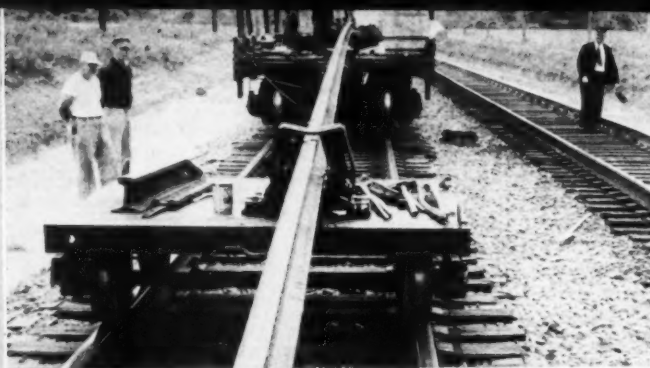
At night, when driving conditions are even more hazardous, the legibility of restricted-clearance signs becomes of greater importance.

Some railroads have adopted a policy of not posting any restricted clearance signs on any of their underpass structures on the premise that they make the roads liable for damages resulting from such accidents. But, they do permit restricted-clearance signs to be posted if the highway departments do the posting and absolve the railroads from any responsibility for accidents resulting from the information given. This practice is one way to avoid paying damages but it doesn't save the bridges from injury nor prevent personal injuries.

On the other hand, there are still many railroads which do post restricted-clearance signs. It would seem that if the posted signs could be made with larger figures and letters, so they would be more legible, and with a reflective material to pick up the light from headlights, some reduction in such accidents would be brought about.



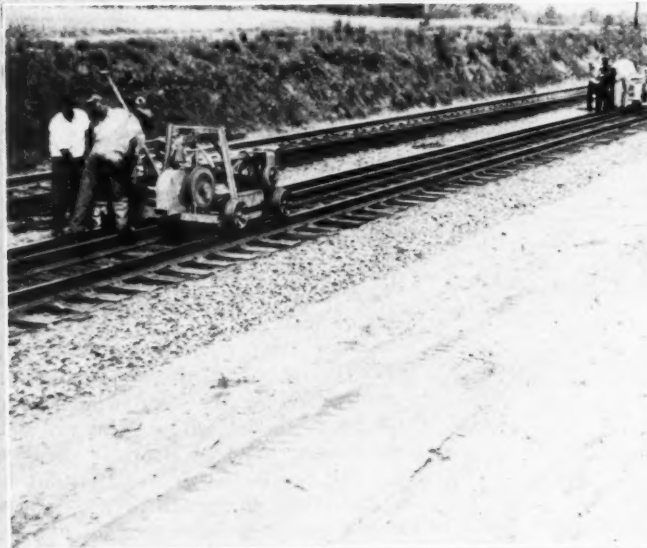
AREA Committee Sees ...



A LONG RAIL is unloaded by threading end through "eye" of needle car and anchoring it to the track, then pulling train from under it.



TWO POWER WRENCHES, working one on each side of the old rails, removed the nuts from the bolts.



TWO SPIKE PULLERS made short work of pulling all of the spikes except those at the joints which were pulled by men with clawbars.

... Welded Rail Laid on RF&P



TIES WERE ADZED by three machines, the operators of which wore metal protectors on their legs.



A CREOSOTE APPLICATOR applied a protective coating to the adzed tie surfaces then new plates were placed with special lifters.

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Practices are observed at first hand by the Special Committee on Continuous Welded Rail. What they saw was the laying of 1170-ft. strings of rails by a highly-mechanized gang of 161 men. Details of the practices followed in welding and transporting the rails, as well as in laying them, are described in this article.

By R. E. Dove
Associate Editor

● The AREA Special Committee* on Continuous Welded Rail went to the heart of the South to hold its committee meeting on May 26, 1953, the location being Richmond, Va. The meeting was held in the office of J. C. DeJarnette, chief engineer of the Richmond, Fredericksburg & Potomac, immediately after the committee had been guests of the RF&P at a luncheon at the William Byrd Hotel in Richmond. On the day following the meeting, the 12 committee members present, along with 25 other railway and supply men, were guests of RF&P President N. Call, General Superintendent W. T. Rice, and Mr. DeJarnette, and were taken by a special train to Guinea, Va., to observe a 161-man gang laying continuous welded rail. The work is part of this year's rail program which includes the laying of six track-miles of such rail, which, when completed, will give the railroad a total of 20 track-miles.

While the train was en route to Guinea, Mr. DeJarnette explained that the rail being laid was all of the 140-lb. PS section, furnished in 39-ft. lengths with "blind" ends (except for the front and rear ends of the end rails of each string), which had been previously welded in strings of 30 rails (approximately 1170 ft.) by the Oxweld pressure method at a plant that was set up at the north end of Richmond yard. An interesting feature of the welding is that all of the rails (no X-rails) received were welded. The rail was sorted and welded by classes, i.e., the H.C. No. 1, No. 2, and A rails were welded in separate strings so that they could be laid at locations desirable for each class. The "shorts" were welded last because they necessitated some revision in the

rail-welding set-up normally used.

As each string was welded it was moved to a stock pile, after which a Sperry ultrasonic rail detector was run over each string, while it lay side by side with others in the first layer. Then the second layer of welded rails was stored over the first and similarly tested.

Since time did not permit the committee to observe the loading of the strings as well as the laying, the RF&P had already loaded the rails on 40-ft. flat cars and had moved the cars to the laying site. The rails were loaded by means of a crawler crane, mounted on the first flat car, which lifted one end of a string, passed it between the crawler tracks underneath the crane, and pulled it aboard on rollers as far as the cable permitted. A new "bite" of the pulling cable was then taken on the rail and it was pulled forward another notch. This was repeated until the entire length was aboard the cars, after which it was barred over to one side to make room on the rollers for the next string.

When the special train arrived at the laying site, the committee found that the unloading unit of the rail-laying gang had paused in its work to permit the committee to watch the operations. For unloading and laying the long rails the road's rail-laying-and-ballast gang of 30 men had been enlarged by combining the forces of four sections, a tamping gang, an extra gang, a work train gang, and a welding crew with it. When unloading a string, a clevis bolt was placed through the end bolt hole and a cable was looped around one of the track rails for anchorage. The work train was then pulled forward until the rail end was abreast of the "eye" of a "needle-car" placed on the track behind the work train. The cable anchorage was then removed until the cable and rail had been threaded through the "eye" of the needle-car,* and again anchored, after which the train movement was resumed. In this way the rail was unloaded and set upright on the ties between the running rails.

Handy-Talkies Used

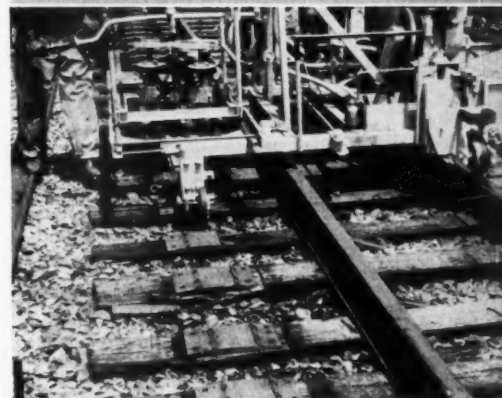
An interesting feature of all movements of the work train was that a brakeman was stationed aboard the flat car farthest from the diesel locomotive and equipped

* H. B. Christianson, assistant chief engineer-system, Chicago, Milwaukee, St. Paul & Pacific, Chicago, is chairman of this committee, and L. F. Racine, chief engineer, Chicago, Indianapolis & Louisville, Lafayette, Ind., is vice-chairman.

* See "Device on Push Car Keeps Long Rails Upright" in July 1952 issue of *Railway Engineering & Maintenance* (now *Railway Track and Structures*).



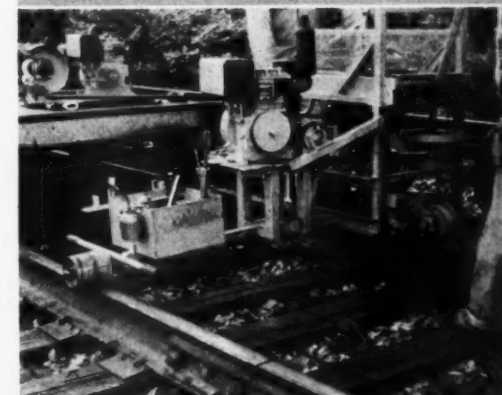
A PRE-GAGING TEMPLATE was used to roughly position the tie plates.



EXACT RAIL GAGE was obtained by spotting plates with gaging machine.



A MO-CAR proved handy at grade crossings and towed spare machines.



A TIE DRILL assured straight-driven spikes in the key gaged ties.

UNIT 1		UNIT 2 (Cont'd)		UNIT 3	
	No. Men		No. Men		No. Men
① Advance unit on grade crossings	5	⑥ Pulling spikes with Nordberg spike pullers	6*	⑦ Placing new tie plates on ties	3
	Total 5	⑦ Knocking off and throwing out old bars	1	⑧ Sweeping new plates clean	1
		⑧ Forking over old rail	1	⑨ Preliminary lining of plates with pre-gager template	2
① Guiding rail on cars with bars	20	⑨ Throwing out old tie plates	3	⑩ Setting plates to exact gage and drilling every fourth tie	3*
② Water boy	1	⑩ Water boy	1	⑪ Water boy	1
③ Unloading rail from train	7	⑪ Punching out broken spikes	2	⑫ Setting and driving wooden anchor pegs in every fourth plate	3
	Total 28	⑫ Setting tie plugs	4		Total 13
		⑬ Driving tie plugs	4		
		⑭ Raking out scrap and ballast	2		
		⑮ Adzing ties with three Nordberg tie adzers	6		
		⑯ Grinding and setting adzzer bits	1		
		⑰ Applying creosote to adzed surfaces with fairmont applicator	1		
			Total 42		

*Includes machine operators

ORGANIZATION DIAGRAM showing the various work operations and equipment used by the RF&P for laying 140-lb. PS rail that had

with a Motorola "handy-talkie" by which he could communicate with the engineman. Hence, he could observe all unloading operations and direct train movements to be made exactly as needed. This was especially helpful not only when starting to unload a string but also at the end of the rail unloading operation.

Unloading the Second String

When the train had gone forward far enough to pull the end of the string being unloaded just about opposite the end of a second string on the cars the train was halted. A track jack, with its base backed against a clevis bolted to the end of the nearly unloaded string, was used to jack the end of the second string back on the cars to the proper position for applying fish-plate bars to join the first and second strings.

The brakeman again guided the forward movement of the train while the second string was guided through the "eye" of the needle car, after which the movement of the train was continued until the second string had been unloaded between the running rails. Shortly after the temporary joint had been passed through the "eye" and when the rail lay on the ties, standard 36-in., 6-hole joint bars were substituted for the fish plates.

The bars were applied with the latest type of RMC plastic packing to prevent frozen joints, and the six bolts were tightened at this time by a hand wrench.

Use Dun-Rite Gager

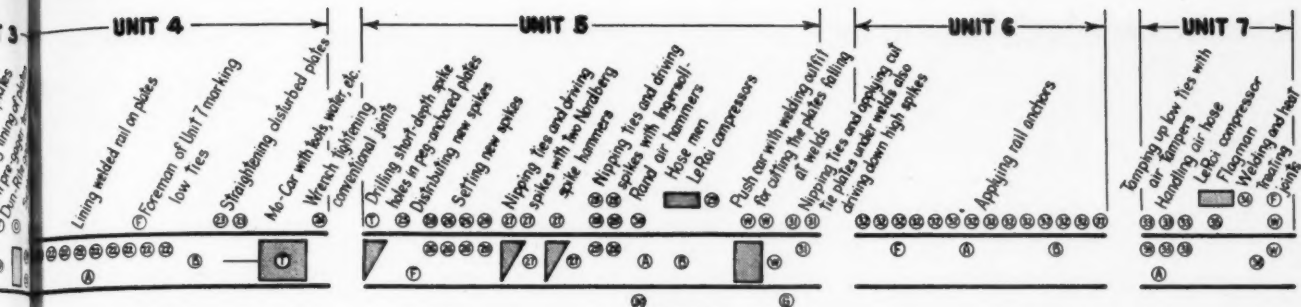
Meanwhile, work was already underway by another unit of the gang (see organization chart) for removing the old rail, which included knocking off the old anchors, pulling spikes, throwing out the bars, rail and plates, setting the tie plugs, adzing the ties, and coating the adzed surfaces with pentachlorophenol. Equipment used in the work included a welding and cutting outfit, two Nordberg spike pullers, three Nordberg

adzing machines, and a Fairmont creosote applicator. Also, this unit was equipped with a spare adzing machine which was used for emergency purposes.

A gaging unit followed, which was equipped with a Nordberg pre-gaging unit, and a Dun-Rite gaging machine. This was said to be the first instance in which this equipment has been used in connection with the laying of welded rail. It positioned the heavy 8-in. by 14-in. tie plates without any difficulty to produce proper rail gage. Since the rail was being laid on tangent track, the anchor-spike holes were drilled by the gaging machine at every fourth tie, after which treated special wood pegs were inserted and tapped down to



THE SPIKES in every fourth tie were driven by Nordberg spike hammers while those in the intermediate ties were driven by Ingersoll-Rand air hammers.



UNIT 4		UNIT 5 (Cont'd)		UNIT 7	
	No. Men		No. Men		No. Men
① Lining welded rail on plates	10	② Nipping ties and driving spikes with Ingersoll-Rand air hammers	6	② Tamping up low ties with air tampers	6
② Straightening plates disturbed while lining rail	2	③ Water boy	1	③ Compressor operator	1
③ Water boy	1	④ LeRoi air compressor operators	2	④ Handling hose for air tampers	1
④ Kershaw Mo-Car with water, tools, etc.	1	⑤ Handling hose for pneumatic hammers	2	⑤ Heat treating conventional rail joints	2
⑤ Tightening bolts on conventional joints between strings	1	⑥ Cutting tie plates for upset metal	3		Total
	Total	⑦ Nipping ties and applying cut plates. Also driving high spikes	3		10
	15		32		
UNIT 5		UNIT 6		SUMMARY	
	No. Men		No. Men		Symbol
① Drilling short-depth spike holes with Nordberg tie drill in peg-anchored plates	1	② Applying rail anchors	14	1 General Foreman	①
② Distributing new spikes	1	③ Water boy	1	8 Foremen	②
③ Setting new spikes	8			8 Assistant Foremen	③
④ Nipping ties and driving spikes with Nordberg spike hammer in every peg-anchored plate	5		Total	3 Machine Operators	④
			15	2 Apprentice Trackmen	⑤
				7 Welders	⑥
				149 Laborers, crossing men, water boys and flagman	⑦

been previously welded into strings 1170 ft. long. This gang was formed by combining several section and extra gangs.

hold the plates exactly as the machine positioned them.

With the plates now lined up, another unit of the gang lifted the welded rail onto the plates with lining bars. Any of the loose plates that were disturbed by this operation were restored to their positions. A Kershaw Mo-Car crane came next. It was used for turning the on-track power machines, for lifting and moving replaced rail out of highway crossings, as well as for towing push cars loaded with water barrels, tools, etc.

Spikes Started with Tie Drill

This work was followed by a spiking unit. A Nordberg tie drill* was used to bore holes about three

inches into the tie through the line-spike holes of the peg-anchored plates. This assured proper starting of these spikes without disturbing the position of the tie plates. Two Nordberg spike hammers were employed to drive the line spikes in the peg-anchored ties and four Ingersoll-Rand air hammers, powered by two LeRoi Tractair compressors, were employed to drive the line spikes in the intermediate tie plates.

For accommodating the upset metal on the underside of the welded joints where they occurred over the plates, the road had a welder equipped with a cutting torch remove a rectangular section about 3½ in. wide from between the shoulder of the tie plate. With

this method the upset metal fits loosely in the hole and the tie plate is in one piece.

After the application of the rail anchors to the new rail—the anchors were applied in accordance with the AREA recommendations—a tamping unit followed and brought all loose ties up tight against the rail. The foreman of this unit had marked the low ties at the time that the rail was barred onto the tie plates when the low ties could be readily seen. By having this small tamping unit with the rail gang, the track could be turned over after each day's work for full-speed night operation. Welders followed the tamping unit and heat-treated the rail ends at the conventional joints between the welded strings.

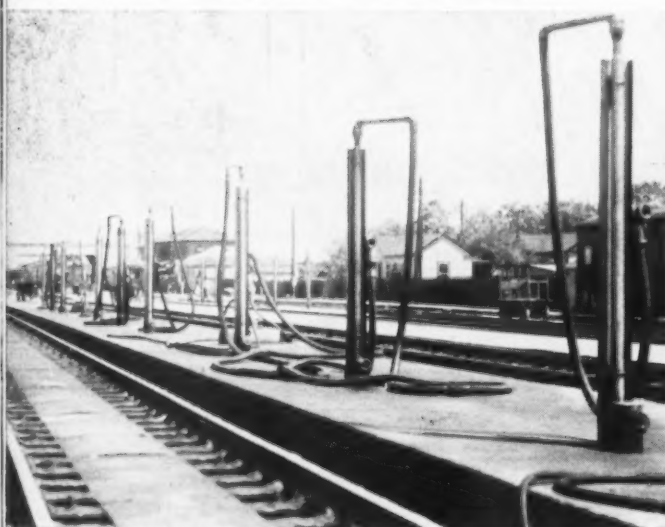
The two strings of 30 rails each, which the committee saw installed, were laid in 45 min. Time did not permit the committee to watch the laying of more than the two strings, and to facilitate train connections for the members traveling north and west, the RF&P ran the special train into Washington, D.C. Those few committee members who were bound for easterly and southerly destinations returned to Richmond by automobile.



ALL LOW TIES are tamped up before traffic is allowed over newly laid rail so that the track can be turned over at night for normal traffic speeds.

* See "Hold-Down Studs Go in Two at a Time" in the March, 1953 issue of *Railway Track and Structures* for description of this machine.

Recommended Features . . .



CONCRETE PLATFORMS of this diesel-fueling station are recommended types but hoses should be kept off ground.



COUNTERWEIGHTED nozzles and hoses, which are kept off the ground, are features of this modern fueling station.

Fire Protection at Diesel Facilities . . .

Part 1 — Fueling Stations and

The fire hazard at diesel fuel dispensing stations arises from two principal factors—improper design or construction of the facilities and carelessness in using them or in other respects. Features of design and operation that will minimize the fire hazard are discussed in this article. Recommendations regarding types of fire-fighting equipment for use at such installations are also made by Mr. Wicker.

By W. S. Wicker

Chief Engineer
Transportation Mutual Insurance Co.
Philadelphia, Pa.

● Fire hazards at diesel fueling stations are largely due to carelessness in the handling and dispensing of oil, and also to operations and conditions not a part of the fueling process. Leaking joints, ineffective sight gages which encourage filling tanks to the overflow point, and normal wastage when removing fuel hose nozzles from tank connections account for large amounts of fuel loss. Less controllable hazards involve trespassers, sightseers, smoking and exposure.

Reports of fire prevention men in

the field disclose that the general situation on railroads throughout the country in connection with fueling diesel locomotives is far from satisfactory. Considerable leakage or spilling of oil is reported at the majority of the locations. A large portion of the waste may be caused by careless practices but there is also much leakage due to features of installation.

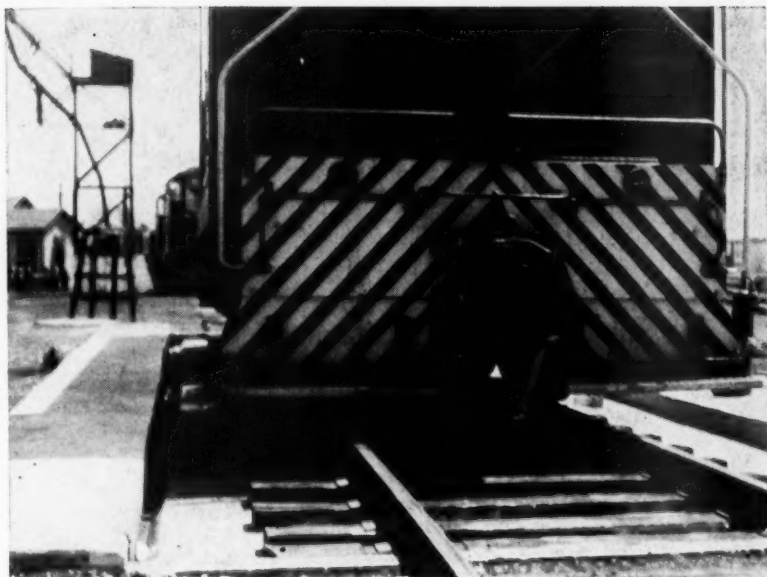
In pronounced cases of spillage and leakage the economic waste may be appreciable. In one instance where measurements and estimates were made the waste of oil amounted to about 3,700 gal. during a 30-day period in fueling 15 diesel units every 24 hrs.

The fire hazard from spilled diesel oil is very real inasmuch as this

oil will give off flammable vapors at temperatures which are ordinarily encountered, especially during summer weather. These vapors are heavier than air and can be ignited by sparks, hot coals and other means. A fire in the vapor above oil-soaked ground at a fueling location can be quite sudden and intense and can do considerable damage to diesel units.

Minimize Careless Handling

In order to minimize the possible effects of carelessness, the fueling installation should be so designed that there is a minimum opportunity for careless handling during the process of unloading the diesel oil from tank cars and fueling the diesel locomotives. The installation of concrete slabs or aprons at the track areas of fueling locations will decrease the fire hazard to a minimum. Cooperative action by the railroads and the manufacturers of diesel units may evolve a design of fill pipe on the tank of each diesel unit which will eliminate leakage. Also, the use of properly designed nozzles will reduce the danger of overflow.



CONCRETE SLABS of the type shown in this view, taken at a small washing platform, are suitable and desirable for use at small diesel-fueling stations.



CATCH BOX of newer type but with iron nipples. Non-ferrous nipples are better.

Platforms

The wastage of 3,700 gal. of diesel fuel oil per month at the current price of diesel oil will amount to enough in the course of a year to purchase probably a hundred fire extinguishers suitable for first-aid protection at diesel fuel-dispensing stations.

Fueling of diesel locomotives from commercial oil trucks has been done with less than one fluid ounce of spilled oil. If, by improved and careful methods of fueling diesel locomotive tanks, the excessive spillage is avoided the first-aid fire protection appliances can be secured at little additional cost above present expenditures. Once the fueling stations are protected all future savings will be net.

Avoiding Leakage of Oil

Possibly the most vital detail in connection with diesel operation is the handling of the oil fuel. Oil leaks from the service hose and couplings are a condition to be avoided. Serious damage to track, to structures, and to locomotives and cars may be caused if deposits of oil on the premises are ignited from any source, including hot

coals from steam locomotives, upset torches or lanterns, fuses and blazing material from adjacent rubbish fires or imperfect incinerators.

The connection of supply hoses to locomotives can be made from the top of a riser so that all oil will flow from the hose before it is disconnected from the locomotive. Even the detail of the coupling connection may require examination. If this is of the design for quick application a detail of locking it firmly against displacement should be provided. A serious flooding of the premises might occur if the hose should become disconnected while filled with oil still under pressure from the pump.

The installation of fueling hoses has changed from the earlier make-shift types to counterweighted hoses which keep the hose and nozzles clear of the ground. Where longer or non-counterweighted hoses are used, supporting racks and catch-boxes have been provided at some installations. The catch-boxes support the nozzle when not in use and surplus oil drains to a common sump for reclaiming.

Some of the older methods employed while fueling diesel locomotives are very crude, as they use screw nipples and some times iron pipe connections on heavy fueling valves through quick couplers, all of which have a tendency to leak throughout the fueling period. When such connections are broken after fueling is completed a spill-

First of a Series

There is a need for the wider dissemination of information on ways and means of preventing or minimizing fires at the various types of diesel installations, and of dealing with them after they have started. The training of personnel in the use of fire-protection equipment is an important aspect of this subject. In recognition of the seriousness of the problem, *Railway Track and Structures* has requested Mr. Wicker to prepare a series of articles, of which this is the first. Ensuing installments will deal separately with the problem of fire protection as encountered at unloading tracks, fuel-oil storage and supply tanks, and diesel servicing buildings and repair shops. The final installment will discuss the training of personnel.—Editor.

age of oil takes place some times as much as two or more gallons in older installations.

Better Attachments Available

Newer attachments with a quarter-turn quick coupler having the male end on the intake pipe of the diesel locomotive tank and the female end on an extension nipple attached to an automatic shut-off nozzle have been developed and

Undesirable Features...



FAULTY DRAINAGE and lack of concrete slab under fueling track (right) are defects here.



FLUSH-TYPE troughs for holding diesel fueling hoses are considered unsatisfactory because of oil, water and dirt accumulations.

are time savers in making fueling connections to diesel locomotives. Some roads are still testing various types of quick couplings. Where practicable the brazing or welding of all screw joints is recommended.

The fuel oil should be delivered to the dispensing hoses by positive pump control. Two or more push-button control switches should be placed in accessible locations to allow immediate shut-down in an emergency. Pilot lights should be provided as an integral part of the switches to plainly indicate when the pump circuit is energized.

Fueling pump motors should not be overloaded by setting up the pressure above the normal operating specifications. This boosting of pressure to permit quicker fueling may result not only in broken fueling hoses and excessive leakage, but also tends to overload the motors, with ultimate breakdown and possible electrical fires.

Earth platforms soon become oil-saturated due to spillage. At some of the fueling stations on railroads which still use steam locomotives, ashes and clinkers are dumped on tracks. Smoking is not, and frequently cannot be, controlled because some of the fueling stations are accessible to passengers and onlookers. After the platforms and tracks become oil-soaked there is the possibility of a flash fire in hot weather due to vapors igniting from lanterns, smoking, fire boxes of steam locomotives or other causes. Any saturated earth or ballast around diesel fueling facilities

should be frequently cribbed out and replaced with clean material until concrete slabs can be provided.

Concrete Slabs Recommended

To avoid oil-soaked ballast and unstable tracks and to secure proper drainage the entire area should be covered with a concrete slab base and tracks laid directly on concrete without ballast, similar to construction of concrete slabs under tracks at wash racks, but heavy enough for main-line operation where fueling stations are on such tracks. Some railroads have provided heavy concrete slabs under tracks where fueling is done on the main line. There are catch-basins along each side of each track, which slope to drains at the center or at the end.

Short ties, one-third as long as regular cross-ties, are laid on the concrete with every third short tie bolted to the slab. Every sixth tie is standard length and extends entirely across the slab. The spaces in the center of track between every sixth tie and the ends of the short ties are made a part of the slab base by filling to tie level with concrete. The platform section should be the usual height above rail, similar to low-level station platforms. Proper sumps draining to a ditch, or pipes leading to an oil separator, are necessary to take care of water and waste oil.

The use of sub-standard stations for the handling of diesel fuel oil

should be eliminated as quickly as possible, because such installations are generally made with temporary electric wiring and service connections, possibly bordering on overloaded circuits.

The nature of emergency-handling facilities is such that the importance of first-aid fire extinguishers at such installations cannot be overstressed, particularly in view of the fact that such facilities may be at points with little or no municipal fire protection. It is wise to provide more first aid-fire protection equipment at such emergency facilities than would normally be regarded as necessary. At one emergency fueling installation conditions warranted the provision of three times as much first-aid fire protection equipment as would be normally indicated, and this large quantity was subsequently found necessary to extinguish a surface fire in the oil-saturated ground adjacent to the fueling station.

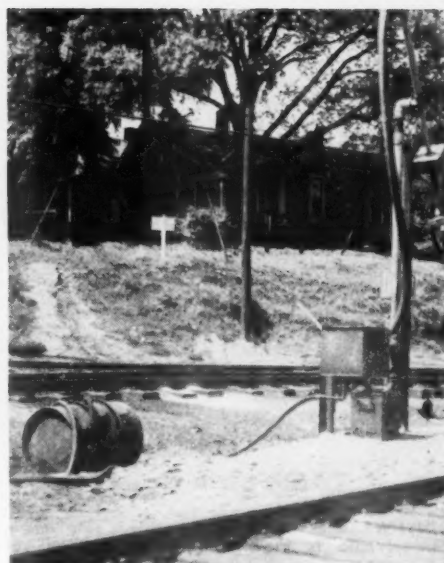
Reduce Spillage

The handling of oil so as to minimize spillage is particularly important at emergency stations because of the possibility of limited fire protection and exposure to and by activities not ordinarily found adjacent to regular permanent fueling stations.

Mobile equipment is most effective in fueling and sanding diesel switching locomotives stationed at outlying points. However, such equipment, once firmly established



OIL-SATURATED ballast under the track at this diesel-fueling installation resulted in the absence of concrete slab and adequate drainage.



SINGLE-HOSE fueling station with catch-box, but premises are oil-soaked in absence of slabs.

for that purpose, has been found very helpful in servicing road locomotives in emergencies. Hence, mobile equipment should be used where possible to replace sub-standard or emergency fueling stations. Each mobile unit should be equipped with two 30-lb. dry chemical extinguishers.

Diesel fuel oil will burn and the vapors from this oil are flammable. Numerous railroads have reduced the acceptable flash point of diesel fuel oil from 150 deg. F. to 125 deg. F. With ambient temperatures in fuel oil pump-houses approaching 125 deg. F. or higher, and with recorded temperatures in some parts of the diesel locomotives ranging from 140 deg. F. to 163 deg. and even 180 deg. in extremely hot weather, there is no justification for ignoring the possibility of flash fires in fuel oil vapor and for considering it a non-inflammable liquid.

What Fire-Fighting Equipment?

In view of the inherent hazards peculiar to diesel fuel oil dispensing stations, as enumerated above, it is evident that adequate fire protection for such facilities is mandatory. The fire protection of diesel fueling dispensing stations and platforms should consist of 20-lb. carbon dioxide extinguishers or 30-lb. dry chemical extinguishers placed at convenient locations. Some railroads are providing at fueling stations fire-extinguishers of the same size and type used on diesel loco-

motives. This is done so that if an extinguisher on any locomotive has been used between stations the empty extinguisher can be exchanged at the next fueling station for a full one. The high values are in the diesel locomotives and such units are thus protected throughout their run. Train crews are required to notify dispatchers of the exchange of extinguishers at the first opportunity after the empty extinguisher is left at the fueling station.

Since it is desirable to have such first aid-fire protection immediately available in case of fire, extinguishers should be placed at the ends of platforms and at every other fuel column. With this arrangement it will not be necessary to travel over 30 ft. to secure an extinguisher. To protect them from the weather or mechanical injury, the extinguishers should be housed in suitable metal cabinets with metal doors. Each cabinet should be painted red and the words **FIRE EXTINGUISHER** should be stencilled on it.

The above mentioned spacing will provide two extinguishers at the average fueling station and three or four for the larger ones. One extinguisher is all that can be justified at a small one-hose station. At the very large stations where fueling is frequent a 50-lb. carbon dioxide, a 150-lb. dry chemical or a large mechanical foam extinguisher on small wheeled trucks, in addition to the smaller extinguishers recommended, can be justified.

In addition to the normal com-

plement of hand fire extinguishers a high-pressure steam outlet with hose attachments, where steam is available, is very desirable not only for cleaning purposes but also for extinguishing any fire which may occur in the under-carriages of the locomotive.

High-pressure fog nozzles, served by a supply of water at a pressure of not less than 90 psi. should be available at all fueling stations where practicable, as the water fog has a blanketing effect from steam generated when the small particles of water are evaporated, as well as a chilling effect to reduce the burning oil below the kindling temperature. In yards equipped with hose carts and fog nozzles the extension of the fire lines to the vicinity of the fueling operations will permit fog screens should they be needed. A combination of any or all of these fire-fighting facilities may be very advantageous in handling a fire of any magnitude.

Smoking should be prohibited in the vicinity of diesel fuel dispensing stations. Conspicuous signs should be posted reading: **FLAMMABLE LIQUID—Keep Open Lights and Fire Away—NO SMOKING.**

All diesel fueling stations should be well-lighted by flood lights. If stations are located where trouble from trespassers is possible, facilities should be enclosed with woven wire fencing and the vital portions of the layout kept locked when not in operation, or when authorized personnel is not available.



DOWNWARD TREND in M/W accident rate and number on the Pennsylvania is attributed to far-reaching safety program.

Reducing M/W Accidents by Taking Safety Into the Home

Superintendent of safety of the PRR's Western region explains how this road enlists the aid of employees' wives in the safety program. Other practices that have helped to reduce the accident ratio on this road are also named.

• An important phase of the safety program on the Pennsylvania is the practice of "carrying safety into the home." This fact was brought out in an address made at a recent meeting of the Safety Section, Association of American Railroads, at Cleveland by Berkeley Ward, superintendent of safety of the PRR's Western region. In developing this point Mr. Ward brought out the fact that many sectionmen live in small communities "where contacts are more intimate than when the men are lost in a large center." Because of this situation "the track foreman hears from his men about their family affairs, their problems, and their troubles. This is also true of the supervisor."

These conditions, he stated, offer an opportunity to expand the safety program in a way that will help the cause of safety on the railroad and "also improve the individual's loyalty, interest, and morale, a subject well worth any effort in this day and age." This can be done, he added, primarily by carrying safety into the home. Mr. Ward indicated that the success of such a venture hinges largely on the ability to enlist the interest and support of employees' wives. Several steps for accomplishing this end were mentioned, as follows:

First—By sending company magazines, news and safety bulletins to the employee's home address. These to contain interesting personal items, bits of humor, etc., all with the underlying motive of stressing safety in the home.

Second—Evening meetings can be held for employees

and their families where an interesting speaker, moving pictures, and refreshments should be provided.

Third—Enlist the help and cooperation of the local chairmen of the labor organizations and their wives.

"This entire program," he said, "like any other effort, will not be 100 per cent successful. Some will stay out of it, but if a substantial percentage can be convinced, the dividends in improved safety performance and better morale will be found well worth the time and effort expended."

Proof of Effectiveness

"We on the Pennsylvania," Mr. Ward continued, "are not speaking from theory or idle speculation, for over a period of years we have put just such a program into effect with what we believe to be most satisfactory results. You may ask, what is the proof? If you will pardon the inclusion of a few statistics, I think they will speak for themselves. Among the approximately 17,000 M/W employees on the Pennsylvania, the accident record for the past ten years is represented in the accompanying graph."

"You will note that, since 1945, our accident ratio has shown a steady downward trend. We attribute this to the following factors:

- (1)—Adoption of sensible working safety rules and strict compliance therewith.
- (2)—Use of well-maintained, modern tools and equipment.
- (3)—Emphasis on good housekeeping.
- (4)—Insistence on the use of goggles and safety shoes at all times.
- (5)—Safety education of on-the-ground supervision. (This we believe to be of paramount importance for, after all is said and done, the foreman is the keynote to the success or failure of a safety program.)
- (6)—Prompt and thorough investigation of all accidents with a view to preventing a possible recurrence.
- (7)—Spreading the gospel of safety in the home as well as on the job.
- (8)—Institution of competitive contests for safety posters, slogans and ideas.
- (9)—Use of safety talks, motion pictures, rallies, etc., to keep the subject of safety interesting and alive at all times.

"We have inaugurated on seven of our divisions, five of which are in the Western region, a traveling safety school, which we have termed a 'Safe-Mobile.' This unit is equipped with sound and motion picture equipment, samples of safety shoes, facilities for goggle inspection and minor repairs, and is manned by a trained instructor. By its use, we take safety to the men on our time, rather than force them to attend classes on their own time. This program has produced excellent results and, best of all, is received most favorably by the men themselves."

"In conclusion, let me emphasize that safety is a full-time job, and we can only expect to get out of it just what we put into it. We cannot afford to relax our vigilance for one moment or, when we are fortunate enough to have a good performance, be lulled into a spirit of complacency; but on the other hand, we must at all times demonstrate by word and action our utmost enthusiasm and sincerity, and constantly be on the alert for new ideas."



REPAINTING this huge structure will require the application of approximately 17,500 gal. of paint.

Underway at New Orleans . . .

Man-Sized Bridge-Painting Job

The Huey Long bridge across the Mississippi is being given a general repainting for the third time in its 18-year life. Three coats—red lead, brown lead and aluminum—are being applied. This article is a general description of the undertaking with emphasis on the more unusual devices or practices in use.

● Bridge painting on the grand scale is one way to describe the project now underway for repainting the huge combination railroad and highway bridge that spans the Mississippi at New Orleans. This is the third time that the bridge, known as the Huey Long bridge, has been repainted in its entirety since it was placed in service in December 1935. The time required to do the job and the quantity of paint to be applied afford a measure of the amount of work entailed in repainting this 4.35-mile structure. The present repainting project was started early in 1952 and will not be completed until about the end of this year. It will require the application of about 17,500 gal. of paint.

To promote speed, economy and safety in carrying out this vast repainting job some interesting and unusual methods and devices have been developed. Before describing these, let's take a closer look at the bridge in order to obtain a better understanding of the magnitude of the task and of the problems encountered in carrying it out. The Mississippi River bridge at New Orleans is by far the largest structure spanning that great stream. To achieve a clear headroom of 135 ft. above high-water level it was necessary to build a bridge with unusually long approaches. The approach on the east bank is 8,680 ft. in length and that on the west side of the river is 10,791 ft. long. These approaches are connected by a main river span having a length of 3,524 ft., so that the total length of the structure is only slightly under 23,000 ft. The bridge is

a double-track structure and in addition there is an 18-ft. roadway on each side for the accommodation of highway vehicles.

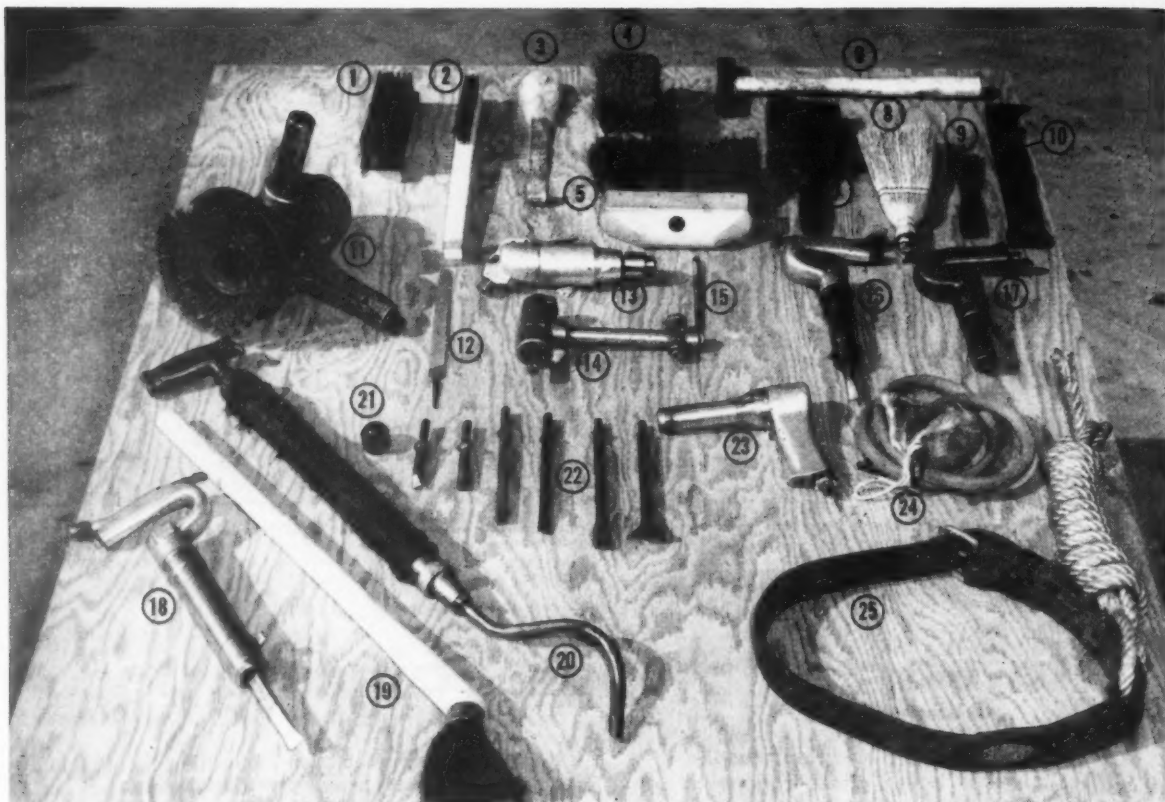
The approaches are of deck-girder construction on structural-steel towers. Each track is supported by two lines of girders. The main part of the structure consists of four deck-truss spans, one simple through-truss span and a three-span through-truss cantilever structure. The vehicular roadways are carried outside the trusses on cantilever brackets.

The bridge is owned and operated by the city of New Orleans through the New Orleans Public Belt Railway, a municipally owned terminal line. General supervision over all maintenance work on the bridge comes under the jurisdiction of E. L. Mire, chief engineer of the railroad, and under the direct supervision of Edward F. Garland, bridge supervisor. Once a year a complete and thorough inspection of the condition of the structure is made by representatives of Modjeski & Masters, consulting engineering firm, which designed the bridge originally.

Serious Corrosion Problem

Although the bridge is about 60 miles from the Gulf of Mexico, and hence is not subject to a salt atmosphere, the character of the railroad traffic moving over it is such as to establish a definite threat of corrosion. Not only does this traffic consist of large numbers of refrigerator cars but there are frequent movements of bulk shipments of such chemicals as sulphur, salt and caustic soda. Movements of liquid chlorine are also common.

To protect the structural members of the bridge from the corrosive effects of drippings from cars carrying harmful lading, and also a fire protective measure for the bridge timbers, the bridge was originally provided with a metal deck covering which was renewed with aluminum sheets several years ago. However, there is certain to be some leakage through even the most ef-



TOOLS, DEVICES AND ACCESSORIES used in scaling, chipping and painting operations on the Mississippi River bridge at New Orleans. (Numbers refer to items in the photograph): (1) and (2) —Wire brushes; (3) Sheepskin swab; (4) Tampico swab brush (for removing dirt); (5) Four-knot brush; (6) Hand chipping hammer; (7) Paint brush; (8) Whisk broom; (9) Chisel scraper; (10) Hand scraper; (11) Cup-type pneumatic rotary brush; (12) File (for sharpening tools); (13) Pneumatic drill (for

scaling work in narrow openings); (14) Pneumatic scaler; (15) Tapered pin reamer for use with (13); (16) and (17) Pneumatic chipping hammers; (18) Weld flux scaling tool (used for chipping); (19) Brush with 30-in. handle; (20) Applicator for hot rust-proof compound (as applied to girders between ties); (21) Spring retainer; (22) Six types of chisels for air tools; (23) Pneumatic chipping hammer; (24) Tail hose for air tools; and (25) Safety belt (used by all men on float scaffolds).

ficient covering. Furthermore, since the downspouts from the gutters extend down only to the undersides of the girders, any fluid carried by them is discharged into the open air where some of it is bound to come into contact with supporting members, such as the columns and bracing in the steel towers on the approaches.

History of Paintings

When the bridge was built the steel work was given a coating of red lead and one of aluminum paint, the latter formula consisting of two pounds of aluminum paste to one gallon of long oil spar varnish. It has been given two general repaintings since then, not including the present one. The first of these was in 1939, and included the approach towers, the outside faces of the girders and the main spans in their entirety. In 1942-43 the inside faces of the girders were repainted. The second repainting job was done in 1945-46. Between successive repaintings the policy is to give the entire bridge a three-coat spotting job, and before each repainting the structure is given another chipping and spotting job.

Complete repainting involves the application of three coats, the first consisting of a spot coat of red lead, the second of a spot coat of brown lead and the third of aluminum. The red lead used is made in accordance

with Federal Specification No. TTP86A—Type 1. For the second coat this formula is tinted with lamp black. The formula for the aluminum paint consists of 1 gal. of glyceryl phthalate varnish to each 2 lb. of aluminum paste.

There are two parts of the structure that comprise an exception to the general painting procedure. One of these involves the top surfaces of the girders between the bridge ties. About ten years ago these surfaces were coated with Texaco Rustproof compound—Type H, which has remained effective ever since. The other exception involves three lines of checkered metal walk plates, each 36 in. wide, extending the entire length of the railroad deck. In the present repainting job the old paint on these plates was removed with a Tennant machine, after which two coats of a rustproof compound were applied.

The organization for maintaining and painting the bridge consists of 18 bridgemen, 17 bridgemen helpers, 1 painter foreman, 16 painters, 1 painter helper, four bridge patrolmen, 1 truck driver, one gardener, 1 clerk, and 4 bridge sweepers (women). This organization is generally maintained the year around except for the painters who normally are taken off the job at the onset of cold weather, although to expedite the present repainting project the painting work was continued through the past winter without experiencing any major interruption.

The removal of old paint and scale is done largely with hand or pneumatic chipping hammers, scalers, and wire brushes. A number of these tools are specialty items, devised or adapted to meet the conditions encountered on this structure. For instance for use in doing scaling work in the small openings or slots in diagonal members, which are made up of angles and batten plates, a small pneumatic drill with a taper pin reamer is used. This tool is made by taking the chuck end from a pistol-grip rotary air drill and attaching it to the motor-and-valve assembly of a right-angle screwdriver with a lever-type valve. The objective was to obtain a shorter tool and one without a pistol grip, as it was felt that a grip of the latter type would be awkward for work on diagonal members. Two tools of this type are in use.

Practically all of the chipping work is done with aircraft-type riveting hammers, of which 28 are in use. These tools are preferred for several reasons. One is their light weight and the fact that they strike a harder blow per pound of weight. Although they deliver fewer strokes per minute, it is said that they remove rust faster than regular chipping hammers. Another reason such riveting hammers are preferred is because the chisels can be retained mechanically, permitting one-hand operation.

Other power tools used in the cleaning, chipping and scaling work include seven 6-in. heavy-duty cup-type wire brushes, three weld flux scalers (used for chipping where the aircraft type riveting hammers won't reach), and three pneumatic scaling tools. Air for the operation of these and the other tools is provided by a 30-cu. ft. Schramm compressor, a 60-cu. ft. Ingersoll-Rand, pneumatic-tired compressor, and two LeRoi units, one of 160 cu. ft. capacity and the other having a capacity of 250 cu. ft.

Tools for Application

Paint application is done entirely by hand. For work on flat surfaces 4-in. leather-bound stucco-type brushes are used. However, for use in special situations, several interesting innovations are employed. One of these is a brush with a 30-in. handle for use in reaching out-of-the-way places. In this item the brush is round or oval, 2 in. in diameter, and is set at an angle with the handle. Also, homemade paint swabs are used for reaching into small openings and for painting narrow edges. These are made of pieces of sheepskin wired to sheet-metal or wire handles.

Those in charge of the painting work on this bridge are of the opinion that simple scaffolding of the type that can be set up by the men themselves is safer than more complicated scaffolding which must be erected by others. For this reason they prefer the use of boatswain chairs, scaffold boards, and ladder-type scaffolds or painters' staging. Another advantage that is given consideration is the fact that simple scaffolding eliminates the cost of employing riggers.

A ball mill is available on the property for making red lead, but its capacity is not sufficient to furnish all the red lead needed for a general repainting job. For this reason, some red lead is bought according to specifications, and is mixed in the ball mill.

The bridgemen and their helpers report for duty each morning at the administration building, located on the east bank of the river, and are taken to the site of the day's work in a truck. The painting crew, on the other hand, assembles directly at the point where they are to start work, where a portable dressing room is provided.



AIRCRAFT-TYPE riveting hammers, because of their light weight and power, are used for most of the chipping work.



PAINT SWABS of sheepskin, with sheet metal or wire handles, are used for reaching into narrow openings.



BOATSWAIN'S chairs, along with boards and painters' staging, are preferred types of scaffolding on this large job.



STORE ROPE PROPERLY



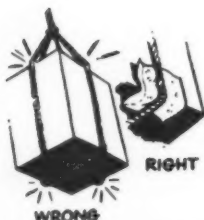
DRY ROPE PROPERLY



KEEP ROPE CLEAN



AVOID KINKS



AVOID SHARP ANGLES



SHEAVE ROPE RIGHT



REVERSE ENDS



DON'T LUBRICATE YOUR ROPE



SPLICING ROPE

ROPE ...

How to Get the Most Out of It

Fourteen rules of proper care are offered by manufacturer. Hints on how to use rope to assure the best results are also given.

SINCE ROPE has wide applications in the railway maintenance field, particularly for block-and-tackle and sheave work on cranes, derricks and pile drivers, its service life is a matter of concern for the maintenance man. The safety of both men and materials depends upon its good condition, and anything that can be done to achieve safety in its use for holding, pulling or lifting operations must necessarily be linked to the steps to be taken to promote the safety, service life and economy of the rope itself. The following fourteen rules for achieving these ends have been listed by the New Bedford Cordage Company, New Bedford, Mass.

(1) **Uncoil Carefully.** The coil should be laid flat on the floor with the inside rope end at the bottom of the coil. When removing "right-laid" rope from the coil (most rope is "right-laid" unless "left-laid" is specified), the inside rope end should be pulled through the center of the coil in a counterclockwise direction as this tends to throw out kinks from the rope and prevents kinks. Left-laid rope should be unwound from the coil in a clockwise direction.

(2) **Store Properly.** For long life rope should be stowed in loose coils off the floor, either on a wood grating or hung on a wood peg, in a dry unheated building or in a well-ventilated room. Improper storage is the common cause of so-called "dry rot," and an unventilated storage space and continued exposure to sunlight are injurious to rope.

(3) **Dry Properly After Wetting.** If rope is stored while wet it will lead to

premature loss of rope life and strength.

(4) **Keep Clean.** When rope gets dirty it should be washed in clean water and then dried thoroughly before storing.

(5) **Protect from Chemicals.** Since many chemicals or chemical fumes are injurious to rope fibers, the rope should not be permitted to have contact with chemicals or be stored in proximity to them. Some of the common chemicals that are injurious to rope are: Acids used in storage batteries or for washing the outsides of buildings; drying oils (such as linseed oil); paint; washing compounds; and animal excreta.

(6) **Avoid Kinks.** When kinks are pulled through restricted spaces, such as are found in a tackle block, the effect will shear the fibers and weaken the rope. Compensating curves "in" and "out" should be thrown if rope use involves continual twisting in one direction.

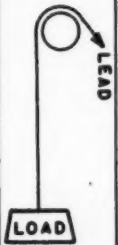

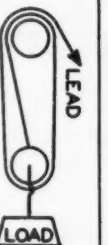

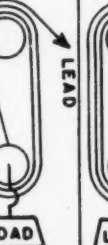
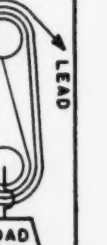
(7) **Do Not Overload.** Overloading of rope is not only a poor practice from the standpoint of conservation but, more important, it is dangerous to men and materials. Although a factor of safety of five is generally used when selecting new rope size for a given job, due allowance must be made for the present condition of the rope and its contemplated application (sling, block-and-tackle, etc.) when applying the safety factor.

(8) **Slack Off Guys.** When used as guy lines, ropes should be loosened when exposed to weather to prevent overstrain due to shrinkage.

(9) **Avoid Sharp Bends.** Bending rope around corners or sharp edges will cut or break the outer fibers.

(10) **Sheave Properly.** The correct-sized sheave should be used for a given rope diameter in accordance with the manufacturer's tables. Small sheaves, in addition to increasing the wear on rope, increase friction load.

(11) **Reverse Ends.** Rope should be reversed periodically, end for end, so that all sections receive equal wear, particularly in tackle use. Should rope become

Circumference of Rope in Inches	Diameter of Rope in Inches	Minimum Size of Blocks in Inches	SAFE LOADS IN POUNDS						
			Lead Line Pull (Lbs.)	1 part fall 1 single block	2 part falls 2 single blocks	3 part falls 1 single blk. 1 double blk.	4 part falls 2 double blocks	5 part falls 1 double blk 1 triple blk.	6 part falls 2 triple blocks
									
1-1/2	1/2	4	530	475	850	1,200	1,400	Do not use 5 or 6 part falls with 1/2" rope	
2-1/4	3/4	6	1,080	970	1,800	2,400	3,000	3,500	
3	1	10	1,800	1,620	3,000	4,050	5,000	6,000	6,700
3-3/4	1-1/4	12	2,700	2,430	4,500	6,075	7,500	9,000	10,000
4-1/2	1-1/2	14	3,700	3,330	6,100	8,500	10,500	12,000	13,500

BLOCK-AND-TACKLE rigging permits the use of smaller diameter rope for a given load, but it is important that the proper sized blocks be used since small blocks produce greater friction and wear on the rope than larger blocks.

damaged, it should be cut and spliced because a good splice is safer than a damaged section.

(12) **Do Not Lubricate.** A well-made rope is adequately lubricated for its service life by the manufacturer.

(13) **Avoid Unnecessary Wear and Abrasion.** Ropes should not be allowed to chafe or drag over sharp edges or rough surfaces as this will damage the fibers and shorten the service life. Also, when rope is dragged over the ground, it picks up sand, grit and other abrasive particles which work into the rope and cut and abrade the fibers. When rope must be run over some surface, such as cleats, winchheads, etc., the surface should be smooth.





(14) **Splice Correctly.** One of the most successful means of prolonging the service life of rope is correct splicing. Since knots reduce the strength of rope as much as 50 per cent, splices are better and stronger for permanent connections.

Rules for Proper Use

The use which is made of rope has a direct bearing on its service life. As a guide for the proper use of rope to most applications of holding, pulling or lifting used in the railway field, New Bedford Cordage offers the following four rules:

SAFETY FACTOR — When selecting rope for any given job, the general rule is to apply a safety factor of five times the rated capacity of the ropes.

SLING ANGLES — When rope is used as a sling, the sling angle should be taken into account as it

Rope Dia. Inches	SAFE SLING LOADS IN POUNDS			
				
1/4	120	210	170	120
3/8	270	470	390	270
1/2	530	920	760	530
5/8	880	1520	1260	880
3/4	1080	1870	1550	1080
7/8	1540	2650	2200	1540
1	1800	3100	2600	1800
1-1/8	2400	4150	3450	2400
1-1/4	2700	4650	3900	2700
1-1/2	3700	6400	5300	3700
1-5/8	4500	7800	6500	4500
1-3/4	5300	9200	7600	5300
2	6200	10800	8900	6200
2-1/4	8200	14200	11800	8200
2-1/2	9300	16100	13400	9300
3	12800	22200	18400	12800
3-1/4	15400	26600	22200	15400
3-1/2	18200	31500	26200	18200
3-3/4	21000	36200	30500	21000

THE SLING ANGLE at which rope is used has an important bearing on the load produced on each leg of the sling. The shorter the legs, the greater the strain.

can place more load on each leg of the sling than the one being lifted. See accompanying table showing safe sling loads for various angles.

MULTIPLE BLOCKS — When using block and tackle, smaller rope sizes can be used if advantage is taken of multiple blocks. See ac-

companying chart showing strength of Manila rope and block-and-tackle rigging.

KNOTS — Various knots have been devised for temporary connections but it should be remembered that, owing to the shearing action, the safe load on knotted rope is reduced.

Economics of Snow Control at Switches...

Various methods are now available for dealing with the problem of snow removal at switches and other types of special trackwork. Among these are electric heaters of the tubular type, remotely controlled gas-burning heaters and the more recently developed snow blower. A recent meeting of the Metropolitan Maintenance of Way Club, New York, was devoted to a symposium on the economics of all three of these types of snow removal. Each part of the symposium consisted of an address giving the experience of an individual road with the particular method. The program evoked so much interest and discussion that the three addresses are reproduced herewith, more or less in full, with the thought that those of our readers with snow problems will find them a constructive addition to the available fund of knowledge on this subject.—Editors



SWITCHES without mechanical snow control spell trouble.



...By Gas Heaters

By Frank Youngwerth
Assistant Signal Engineer
Erie, Cleveland, Ohio

• The management of the Erie has shown considerable interest in the control of switch heaters at remote locations. In the past few years it has authorized approximately \$145,000 for this work and from this expenditure we conservatively estimate we are getting a 40-per cent return.

Railroads operating in this latitude have always been faced with the removal of snow and ice from switches, movable-point frogs and derails during the winter months to assure satisfactory operation of these pieces of equipment. For many years this had been accomplished manually using portable snow-melting equipment, such as carbo-hydrone cans, brooms and shovels, and in many instances continues to be so handled; however, in view of the increased number of remotely controlled switches at out-lying points, larger and more spread-out interlocking plants and the increasing scarcity of labor, such methods of snow and ice removal are far from being economical.

Increasing demands for economy in operation have made it necessary to develop facilities or equipment for the removal of snow and ice from switch points, frogs and derails more economically than the manual methods used in the past. When properly installed remotely controlled gas switch heaters provide excellent continuity of service under all temperature conditions. They normally operate unattended and have the advantages of economy, versatility and reliability.

Minimum of Failures

During the 1950-1951 winter season the installations on the Erie were in operation 10,068 hr., and during the 1951-1952 winter season, 15,580 hr., a total of 25,648 hr., and have functioned through the 1952-1953 winter season, for which I do not have the actual burning hours at this time, with a minimum of failures.

With the availability of liquefied petroleum gas, gas switch heaters have come into more general use, and with improved methods of control of the ignition, plus the indication features that have been developed in the last few years, actual experience has established the

(Continued on page 664)



...By Electric Heaters

By E. V. Grogan
Supervisor of Track
New York Central, New York

● At the present time we have in service, on the Electric division of the New York Central, about 1,110 electric tubular heaters and 730 flat electric heaters. These heaters are in service on all types of switches, including single switches, single-slip switches, double-slip switches and movable-point frogs. These heaters are used on switch points up to and including lengths of 39 ft. Originally we used only a flat-type heater which was placed under the switch point and stock rail on top of the ballast and between the ties for nearly the entire length of the point. These flat-type heaters are being replaced by tubular heaters which have been found to operate more efficiently and economically.

Facts About Tubular Heater

This tubular heater is made of a non-corrosive metal such as German silver, and the heating element is packed in magnesium oxide inside a tube. The tube is $\frac{1}{2}$ in. in diameter and is fastened under the ball of the stock rail by clamps. It is necessary to drill $\frac{1}{8}$ -in. holes in the stock rail for bolts to hold the clamps in place. The two center bolts holding the clamps are tightened, but the other bolts are left a little loose to allow for expansion when the heat is turned on. This tube heats from a point 6 or 8 in. ahead of the switch point to a point 2 to 8 ft. ahead of the heel of switch, depending on the length of the switch point. When installing tubular heaters it is necessary to grind the reinforcing on the inside of switch points as well as the stops on the switch points in order to provide proper clearance for the tubes. When ordering switch points from the factory, the points and stops are ground according to New York Central plans.

The electric current used on the Electric division is furnished by Consolidated Edison Company of New York at a wholesale rate. A tubular-type heater will consume about 300 watts per foot of heater, and the cost of operating a tubular heater on a 16-ft. 6-in. switch is about 18 cents per hour. The cost of material and labor for installing a tubular heater on a switch of this length is from \$500 to \$600, depending on the

(Continued on page 665)



...By Pneumatic Means

By Lloyd J. Gilmore
General Roadmaster
Great Northern, Spokane, Wash.

● The cost of cleaning snow from switches by hand labor at present wage rates, plus time-and-a-half for overtime and for Saturdays, Sundays and holidays, is almost prohibitive. Furthermore, it is difficult to obtain sufficient labor on short notice during and immediately after storms to perform this work. Also there is the problem of transporting men to outlying locations during a storm or in bad drifting weather. In some instances, we have had to provide heated shelters at outlying points and to have men on the job for three 8-hr. shifts to keep important switches operative around the clock.

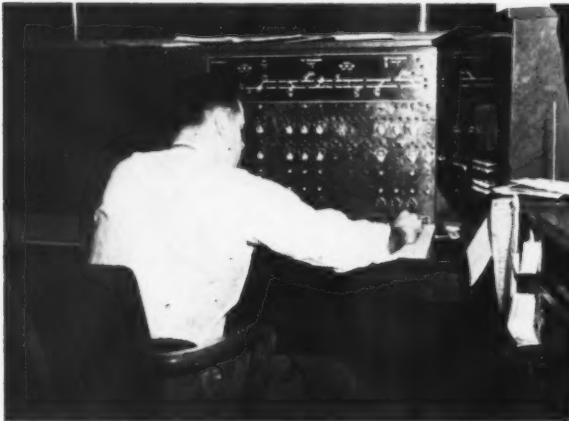
One such installation is a switch at Summit, Mont., where westward trains enter the double track and eastward trains leave the double track. This switch is electrically operated by remote control from the station one-third of a mile distant. Summit station is the actual summit of the Rocky Mountains where there is almost constant strong winds and drifting. During the winter of 1951 and 52 the total cost in hand labor to keep this switch free of snow was \$2758.95.

Early in October 1952 we installed at this location a blower-type switch cleaner. Between November 15 and April 15 there were 226 in. (approximately 19 ft.) of snow fall, and during this period the switch cleaner operated 1,587 hr. The only hand labor used on this switch during the entire winter was expended between January 18 and 20, and cost a total of \$42.51. This expenditure was incurred because of difficulty with the exhaust valve spring on the compressor. The operating cost of the switch cleaner for electric current, alcohol anti-freeze and oil for the compressor, amounted to \$217.42. Thus, the total cost of keeping the switch operative was \$259.93, or a saving of \$2,499.02 as compared with the previous winter. During a test period, which extended from December 24, 1952, to January 24, 1953, the average cost of operating the snow blower at Summit was 13.7 cents per hour, including electric current, anti-freeze and lubricating oil for the compressor.

The blower-type switch cleaner has an interesting history. A little over three years ago one of the road-

(Continued on page 665)

Economics of Snow Control at Switches (Continued) . . .



CONTROL PANEL for gas switch heaters on the Erie.

. . . By Gas Heaters

fact that remotely controlled gas-burning switch heaters may be installed with the assurance that they will function as intended irrespective of the severity of the weather. The packaged ignition system is a self-contained unit not dependent upon commercial power, thus eliminating the possibility of failure due to the formation of ice on wires and similar conditions which prevail very often at the time when the functions of the switch heater are most essential.

At the beginning of the 1951-1952 season we had a total of 77 switch-heater installations, comprising some single switches, and other groups of two to eight switches. Various methods of control were used. Fifty-eight of the installations were remotely controlled—7 by direct wire, 49 by code, and 2 by simplex circuit—and 19 are locally controlled by direct wire. Fifty-six of the switch heaters installed are provided with means for return indication, a very essential provision particularly at outlying switches not under visual observation. The return indication assures the operator that the ignition system has functioned and that the heater is in operation.

As with any new development we had our period of travail before we produced what we consider the best combination of heater, ignition and gas storage, but with each installation we profited from experience.

Problems of Gas Storage

Take the gas storage for instance. At some installations we use batteries of 100-lb. capacity cylinders, and at others bulk-storage tanks ranging from 500 to 2500 gal. water capacity. However, those versed in the use of liquefied petroleum gas know that temperature to a great extent controls the amount of gas that can be usefully extracted from the storage container. It has been determined that the most economical storage and use of liquefied petroleum gas occurs when bulk tanks equipped with vaporizers are used. Without a vaporizer the amount of propane gas that may be taken from a tank in a given time is fixed by the surrounding temperature and the amount of liquid petroleum in contact with the storage-tank walls.

The amount of gas that can be taken falls off rapidly as the surrounding temperature goes down. This seri-

ously limits the amount of gas that may be taken from a tank of any given size. The vaporizer overcomes this limiting feature and facilitates the extraction of the maximum amount of gas from any tank. It also permits operating throughout the season on one filling of the minimum-sized tank. The vaporizer depends for its operation on a main burner flame which is turned on when gas is drawn from the storage tank and which is lighted by a pilot flame. The main burner flame brings the liquid petroleum up to the proper temperature for vaporization, thereby eliminating any restrictions that would otherwise be imposed by a fall in atmospheric temperature.

I will not burden you with figures illustrating what this means in terms of the pounds of gas available in a storage tank of a given size. Suffice it to say that the use of a vaporizer permits a considerable reduction in the size of the tank for any installation, and eliminates the objection to bulk-tank storage which, without the use of a vaporizer, very often required the use of an excessively large tank.

Gives Cost Figures

Now let me give you some figures on the cost of installation and operation of these switch heaters. We have installed at this time a total of 83 switch heaters using liquefied petroleum gas. The investment in them is approximately \$145,000. Installations at 57 switches and 2 derrails represent a capital investment of \$76,859. The annual operating expense is \$11,692, a reduction of \$46,971 compared with the annual operating expense previously incurred. Hence the return on the investment is about 55 per cent. Perhaps this would be more interesting to you: L.P.G. switch heaters at 62 switches and 2 derrails in the 1951-1952 season burned a total of 13,404 hr. at an average cost of \$0.53 per burning hour for gas.

The economy of operation of any installation can largely be determined in the initial engineering. For instance, an architect in designing the wiring of a house does not put the control of all lights in all the rooms on one switch only. He controls the lights in each room separately, so that only the lights necessary in the room in use are on for the required period. So it is with switch heaters. Controls are arranged so that heaters on switches in the line-up most frequently used are on the same control, thereby eliminating the consumption of gas in melting snow at switches infrequently used. Furthermore, except in very severe and continued snow storms, heaters are generally turned on 15 min. preceding time of train movement; if there are no moves over the switches within a short period of time it is economical to turn the heaters off thereafter.

The efficiency of the L.P.G. switch heater precludes the necessity for continuous operation. The elimination of continuous burning does not detract from its effective capacity in the removal of snow and ice from switches and does enhance its attractiveness from an economy standpoint in the removal of snow and ice from switches, frogs and derrails ahead of train movements. To assure obtaining the available economy from this angle we issue instructions to operator-dispatchers to the effect that, barring extremities of cold, raging snow and wind, etc., and in view of the fact that heaters can produce a temperature of 96 deg. F. inside the base of the rail in 16 min., it is not necessary or essential for continuous operation of the heater for full effectiveness.

... By Electric Heaters

location. These installations on our Electric division are made by men from the transmission department, who are the regular maintenance men in the service of that department.

In snow storms two maintenance men from the transmission department are assigned to each large interlocking plant and to large yards in order to be on hand in case of trouble with the electric heaters. Since these men are regularly assigned to out-door work they would be unable to perform their regular duties during snow storms; therefore, a considerable saving is realized by having these men available. The heaters are turned on at interlocking plants by the tower man on duty and in yards by the transmission men. The transmission department has men on duty 24 hr. a day; therefore, it is not necessary to call our men out on overtime to turn on these heaters. We are permitted to turn on the heaters with section men where no transmission men are located. We have had very little trouble with heaters of this type.

Example of Performance

On our Electric division where the snow fall is not as heavy as at some other points on the New York Central System, the heaters are used from 200 to 300 hr. per winter. Therefore, I would like to give you an example of the installation and cost of electric tubular heaters which are located at a high-speed interlocking plant consisting of six No. 20 crossovers with 39-ft. switch points. These switches are located in the Mohawk valley near the foothills of the Adirondack mountains. The weather conditions in this locality are often quite severe as the storms usually approach from the west and follow the river. These are remote-controlled switches operated from a signal tower four miles distant, from which the heaters are turned on by the tower man.

During the winter of 1951-1952 the maximum depth of snow measured by the U.S. Weather Bureau at this location was 86.8 in. The maximum depth of snow on the ground at one time was 3 ft. and the lowest temperature was 17 deg. below zero. There was considerable drifting of snow during the winter; also several ice storms. The cost of operating these heaters during the winter of 1951-1952 was \$5,335.92. The cost of installation was \$12,000.

The value of the heaters at this one interlocking plant can best be appreciated when it is considered that it would require at least one foreman and six laborers to clean this snow by hand at perhaps three or four times the cost of operating the heaters, plus the danger of accidents happening at a remote controlled switch located at a considerable distance from the tower, as no warning to these men could be given of the approach of trains.

More Efficiency Needed

We in the maintenance-of-way department are faced these days with the problem of operating with less money, and must of necessity buy equipment which will not only operate more cheaply but more efficiently than labor. Certainly the electric snow melter is an example of this. Punitive and double-time rates, as well as the inefficiency of hundreds of men hired during snow storms to work in yards and interlocking plants, are not in keeping with modern railroading.



ELECTRIC switch heaters protect Cleveland Union Terminal.

My personal experience with electric snow melters has been limited to five years. In that time I do not know of a single delay caused by a snow melter not doing its job. I am happy to say I was not on the Electric division in December 1947 when the U.S. Weather Bureau recorded the heaviest snowfall in the history of New York City. However, I have been reliably informed there was not one known case of a switch failure causing a delay where an electric heater was in operation during a storm.

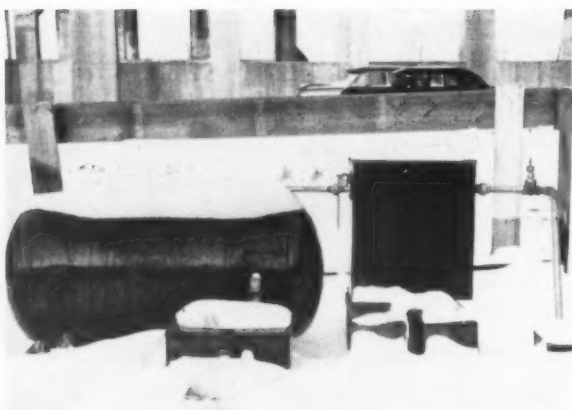
Another important factor to be considered is that an electric switch heater can be turned on as soon as a storm starts; thus it is not necessary for the towerman to wait until men are called and become available on the job. I would be very happy if every switch on my territory were equipped with electric switch heaters as the result would be a considerable saving in sleep for me as well as a saving to the railroad company of many dollars.

In the past few years, our maintenance-of-way departments have become mechanized to a great extent with power tampers, cribbing machines, ballast cleaners, spike pullers, spike drivers and various other machines. To take care of snow, we have purchased spreaders, steel snow plows, steel flangers, snow melters and power snow-brooms, etc. Yet in a large percentage of cases we are doing the job just as we did 40 years ago. Cleaning snow from switches with shovels and brooms is an example. I think the time has arrived when we should have snow melters of some description in large terminals and yards.

... By Pneumatic Means

masters working in this territory conceived the idea of clearing snow from switches by blowing it out with compressed air. The idea at first did not seem either sound or practical because it was thought that the blast of air would have to be constant and would require the use of a large air compressor. However, in carrying out experimental work with a couple of pilot models, a cycling valve was developed that would turn the air supply on and off at a pre-determined pressure. Also an auxiliary air container equipped with a pressure gauge was connected to the air supply.

In one of the pilot models the air supply was drawn



AIR TANKS for snow blowers may be above or below ground.

from the yard line, and in the other model a separate compressor was used which was powered by an electric motor. The air would be allowed to build up in the container to the maximum desired pressure, say 105 psi., at which time the cycling valve would automatically open up releasing a charge of air into a pipe leading to the manifold pipe. The air would blow for a period of four to five seconds or until the pressure in the container dropped to the minimum desired pressure, say 85 psi., after which the cycling valve would close automatically. This procedure would be repeated for as long as required, with the period between blows being 25 to 30 sec.

Some Problems Encountered

One of the problems in the development of the snow blower was to place manifold pipes of suitable size and design under the head of the stock rail on the gage side, so that they would clear the switch points when thrown and would in no way interfere with the opening and closing of the switch points. Another problem was to develop outlet orifices of the proper design, and to space and place them on the manifold pipe so as to blow the snow out from between the stock rail and the switch point in the direction of the point of switch. It was found that these orifices had to be about 15 in. apart and that they must all be turned in the same direction so that the air from one orifice would act as a booster to the next orifice, and so on.

These pilot models, after many changes and adjustments, performed quite satisfactorily. In fact, one of the original pilot models has now run continuously from November through April each year for the past three years and is still operating. It is equipped with the original cycling valve. No hand labor has been performed on this switch during this period. It is located in the yard at Whitefish, Mont., and is connected with the yard air supply.

There were other problems, one of the most serious of which was due to the condensation of moisture in the container. Moisture lodging in the orifice just as the blow ceased would freeze. This has been overcome by the development of an anti-freeze injector that can be regulated to deposit approximately six drops per minute of wood alcohol into the line as the air goes into the container from the compressor. This injector has worked very well, preventing any further difficulty with freezing. Our experience is that the alcohol anti-

freeze is necessary and must be injected into the line uniformly. The injector can be adjusted to deliver a heavier supply of anti-freeze when there is danger of sleet or when the temperature alternates between freezing and thawing.

The last serious problem experienced in the development of the blower was due to the fact that moisture collected in the container and would not blow out. This has been corrected by the development of a moisture trap that can be blown out about once in each 48-hr. period.

Three Pilot Models

In all, there were three pilot models. As stated one was operated with air from the yard supply, and another with air from a separate compressor driven by an electric motor. Since the third pilot model was situated where no electric energy was available a separate compressor powered by an air-cooled gas engine, was used to furnish air for this unit. The performance of all three has been quite satisfactory. We find that the gas engine should be serviced about once in 12 hr. although there was one period during the past winter when it ran 56 hr. over a weekend without service. The one powered by the electric motor should be serviced, or at least be looked at, about once in 24 to 36 hr. I question whether the one supplied with yard air is looked at over twice a week.

Our experience has been that the blower type of switch cleaner is relatively low in original cost and in the cost of installation. Also the operating cost is comparatively low. There are no drainage difficulties, no frost heaving or uneven track because of saturated roadbed, and no uneven track to maintain long into the spring while the roadbed is drying out. There is no fire hazard.

The snow blowers are dependable and keep switches clean satisfactorily so that they can be operated by remote control and otherwise. They will operate for reasonably long periods without service. Maintenance costs are exceedingly low, and they do not have to be removed during the summer months. Nothing is exposed that will be damaged by dragging equipment.

The blowers not only remove snow, but any sand and silt that may be mixed with the drifting snow. No deposits of sand or silt are left on the plates or between the switch points and stock rails. They can also be used at locations where there is difficulty from drifting sand and dirt, as from plowed fields or desert country. They will remove deposits of iron ore or fines from coal cars that have been deposited in switches during car-switching operations.

The presence of alcohol in the compressed air in atomized form prevents sleet from adhering to the switch plates, point and stock rail during sleet storms. The alcohol will also ultimately evaporate ice blocks that may fall from passenger equipment.

The cost of operation for cleaning snow from switches in yards and terminals where trains are made up is especially low with the blowers for the reason that the switch cleaners can be connected to the existing yard air supply. The safety angle here is also important as it is not necessary to employ hand labor at these locations during storms, which has always presented a hazard because of poor visibility.

We have found the blowers satisfactory for use on main track with electrically operated remote-control switches, for spring switches, for manually operated switches and for use at interlocking plants where we have multiple switches and derails.



COMMITTEE 27—Maintenance of Way Work Equipment, of the AREA photographed at Milwaukee, Wis., where it held a meeting

recently. The picture was taken in connection with a tour of the factory of the Unit Crane & Shovel Corp.



News Briefs in Pictures...

LEFT—NEW FREIGHTHOUSE of the Burlington's subsidiary, the Burlington Truck Lines, Inc., adjoins the railroad freighthouse which is now under construction in Cicero, Ill. The trucking facility has a Towveyor system by which four-wheel platform trucks are hauled from the city delivery side to the over-the-road truck side of the house. Corrugated plastic panels, mounted in the roof, daylight the interior.

RIGHT—Primary sorting room of the extensive new mail-handling facilities built at the St. Louis Union Station by the Terminal Railroad Association of St. Louis. Parcel post is delivered from this room direct from cars over a system of conveyor belts totalling 6,500 ft. in length. Traveling deflectors force mail off conveyor belts onto inclined slide tables along both sides of room. Mail is classified and dropped through openings onto other conveyors which carry it to secondary sorting docks on lower level. Here it is loaded on platform trucks for delivery to cars. The new facility was built at a total cost of about \$4,200,000.





WHAT'S THE ANSWER?...

... a forum on track, bridge, building and water service problems

Speed of Wreck Derricks Over Trestles

In view of the increasing use of 250-ton wrecking cranes is it necessary to restrict their speeds when passing over branch-line trestles having 12-ft to 15-ft. panels with 3-ply or 4-ply chords? Why? What maximum speed is considered safe under such circumstances? How is this speed determined?

Too Heavy for Branch Lines

By WILLIAM B. MACKENZIE
Bridge Engineer, St. Louis-San Francisco,
Springfield, Mo.

A 250-ton wrecking crane weighs around 388,000 lb., and has an average wheel load of 32,600 lb. This generally is too heavy and produces moment and shear too great for branch-line trestles with 3-ply chords. Therefore, its operation under such circumstances is not approved.

On main-line 4-ply-chord trestles over panels 14 ft. long, the maximum speed is kept down to about 45 mph on account of mechanical restrictions.

Need More Data

By G. L. STALEY
Bridge Engineer, Missouri-Kansas-Texas,
St. Louis, Mo.

The question, as submitted, is open on both ends. It is practicable, and often done, to have a timber trestle with 12-ft. panels as strong as any trestle. This is also true for a 15-ft. panel, with either panel lengths having 3-ply or 4-ply stringers, since nothing is said in the question as to size of stringers. Our railroads have generally used two methods of fixing main and branch-line trestle capacity. They either use 3-ply chords and vary the panel lengths or vary the number of stringers in the chords. The question can only be answered when specific panel lengths and the number and sizes of stringers are given.

As to speeds, it is safe for operation of wreckers to let the unit stresses run up to 1800 to 2000 psi., and perhaps even higher unit stresses can be permitted. The

speed could only add a maximum of 20 per cent to the static load. The speed at which the wrecker could be operated over the trestle would be determined on this basis.

Cooper E-Rating too High

By J. P. DUNNAGAN
Engineer of Bridges, Southern Pacific,
San Francisco, Cal.

We restrict the speed of all relief outfits, regardless of their weight, to 35 mph on main lines and 25 mph on branch lines. These

speeds are further reduced in passing around curves. Our relief outfits are equipped with steam derricks; a diesel-electric might be permitted somewhat higher speeds.

Our standard trestle has 15-ft. panels with 3 and 4-stringer chords depending on its location, and whether or not it is open deck. The Cooper's equivalent E-rating of these 250-ton relief cranes is too high to permit them on our 3-stringer chords and they are therefore restricted to the main line and those branches that are maintained to main-line standards.

Restrictions Not Needed

By R. E. PECK
Bridge Engineer, Missouri Pacific,
St. Louis, Mo.

Since the Missouri Pacific has no 250-ton wreckers, I have had no occasion for previous consideration

Answers to the following questions are solicited from readers. They should be addressed to the *What's the Answer* editor, *Railway Track and Structures*, 79 W. Monroe St., Chicago 3, and reach him at least five (5) weeks in advance of the publication date (the first of the month) of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the October Issue

1. When using tie tampers of the on-track type in single-track territory, what measures can be taken to minimize the loss of productive time due to interruptions by passing trains? Explain.

2. To what extent is it feasible to shorten the length of long butterfly or umbrella platform shelter at passenger stations to reduce maintenance costs? Under what conditions, if any, may they be dispensed with entirely? Explain.

3. What methods and equipment give the best results when adjusting joint gaps in rails when they have become

too tight or too wide? When should this work be done? Why?

4. What is the best procedure and equipment for handling long precast concrete piles from storage to the pile-driver leads? Explain.

5. What measures should be taken to prevent "buckled" track during surfacing operations when there is a strong possibility of a considerable change in temperature occurring?

6. When it is necessary that overhead oil, steam, air or water lines be carried across two or more tracks, involving a span of more than 20 ft., what means of supporting them are suitable and economical? Explain.

of this matter. However, such information as I have relating to 250-ton cranes indicates that the axle loads vary from 62,800 lb. to 69,000 lb., depending upon whether the machine is diesel or steam powered and whether axle spacing is either 4 ft. 3 in. or 5 ft. 6 in. for each of these types. Such variations in loads and axle spacing, and the fact that size of stringers is not specified, make it impracticable for me to furnish anything other than some

general comments on the subject.

Speed is not a factor in the generally accepted procedure for rating timber bridges, in which the live load is considered as a static load and dynamic effects are not included. The allowable unit stresses for bridge timbers should be established on this basis and should not be exceeded.

Wrecking cranes are normally moved in trains at restricted speeds for mechanical reasons and,

in my opinion, further speed restrictions with reference to timber trestles are pointless.

It is my conclusion that wrecking cranes can be safely moved over timber trestles, without special speed restrictions, provided the trestles are in satisfactory physical condition and the bending stresses in the stringers due to dead and live loads do not exceed allowable design stresses by more than 50 per cent.

Best Types of Machine Parts Lists

What are the advantages and disadvantages of the "exploded view" type of parts list for maintenance-of-way machines? Explain. Is its use more practicable for the shop or for the field mechanic? Why?

Exploded View Best

By R. A. HOSTETTER

Supervisor, Work Equipment and Scales,
Southern Pacific Lines in Texas
and Louisiana, Houston, Tex.

Over the years we have acquired a great many machines, large and small, and all the great variety of parts lists. These lists range from blue-printed, typewritten lists with no illustrations to the more modern exploded-view type.

In the beginning, when our road had only a few machines and everybody concerned with their operation and maintenance were thoroughly familiar with every detail, any sort of parts list was good enough. Today, when everything has been stepped up along with the turnover in personnel, it often happens that a new man in the field is talking to a new parts clerk neither of them knowing the parts by their proper names. A poor parts list under these circumstances often leads to delays to the machine and a consequent loss in dollars. The same two people, both having a parts book with plainly numbered exploded views can, with little difficulty, quickly get together on the parts desired. The exploded view is of equal value to those who have occasion to make written lists.

Some of the manufacturers have parts lists made from mechanical drawings which have merit for certain shop operations, but unfortunately a great many of our operators of smaller machines cannot read a blue print and frequently make errors in ordering parts. In our organization we would much prefer that all parts lists be of the

exploded-view type, believing the advantages would far exceed the disadvantages, if any.

Absolutely No Disadvantage

By C. G. ODELL

M. of W., Repairman, Pennsylvania,
Wooster, Ohio

Parts lists having exploded views of the various units are very valuable to the mechanic. They not only make the ordering of parts much more simple, but they also furnish valuable information on how to assemble the various parts. Such a parts list is particularly valuable in cases where some other person has taken a machine apart and the mechanic, who may not be too familiar with the machine, can easily check for missing parts.

There cannot possibly be any disadvantage in an exploded-view parts list, as the list is still there and if any one does not wish to use the drawings he does not need to do so.

I would go one step further and that is to make the parts list and service manual a single book giving complete information for the use of the mechanic. Any good mechanic is always glad to have all the information he can get. One of the best manuals of this sort I know of is one published by Allis-Chalmers, and while the price is pretty high I have found mine well worth while.

This type of parts list would show a decided economy by having the right parts ordered promptly with the result that ma-

chines would be out of service for shorter periods of time.

Exploded views are just as practicable in the shop as in the field. Neither men in the shop nor in the field can possibly know more about the machines than the manufacturers, and if only an exploded view of the parts is shown, it will speed up his work. Again I say a complete service manual, if at all available, would be considered by me as being a "must" both in the shop and in the field.

Not Needed

By GEORGE S. CRITES
Division Engineer (Retired),
Baltimore & Ohio, Baltimore, Md.

The exploded-view type of parts lists do quite well in show rooms and in sales places by exciting the curiosity of spectators who would not be able to fit nut "G" onto bolt "Q" in an assembly line, but such lists would be consulted little or not at all in shops and never in the field.

Once in a while, when a new mechanic starts to work in a shop, his foreman may show him an exploded-view type of a parts list, but for general shop work both the store room attendants and the shop forces consult the regular printed lists for any information which they may require as they are entirely familiar with the parts of the machines which they are working on.

Too, the working parts of machines wear about the same for the same machines and, if many parts are needed, it is found best when a machine is badly worn or damaged to put in an entire new assembly. Then, if it is possible to turn the worn or damaged assembly back to the factory, this should be done. Otherwise, the old assembly should be scrapped as a unit since labor costs are too great for some repair jobs which may never be re-

quired. No "exploded view" type of parts list is needed to do this, and should only a minor replacement be made in the shop, there is no need for a special parts list for such a

Only running repairs should be made in the field and mechanics assigned to such work should not try to make extensive repairs involving many parts as such work

can be done easier and more economically in a well-organized and well-equipped shop. Such field mechanics should have no need for any exploded-view type of parts.

Importance of Ballast at Ends of Ties

What is the relative importance of the ballast at the ends of ties in resisting the lateral movement of the track? To what extent does the type of ballast have a bearing on this question? Explain.

Shoulder Width Important

By J. P. DATESMAN
Engineer of Track,
Chicago & North Western, Chicago

The width of the ballast shoulder beyond the end of ties, together with the weight and size of the ballast, are all very important factors in controlling the lateral movement of the track.

A track with a narrow shoulder, regardless of the type of ballast used, has less resistance to the lateral forces which are exerted by all train movements, than one with a sufficient ballast shoulder to withstand lateral forces. The consistency and weight of the ballast, of course, governs to a certain extent the width of the ballast shoulder required since a fine light ballast has less resistance to lateral movement than a crushed, well-graded type, regardless of whether it is light or heavy.

The proper width of a ballast shoulder is, of course, a matter of opinion, but it certainly should be wide enough and on a fairly flat slope so as to eliminate the possibility of the ballast particles being vibrated away from the tie ends. This applies particularly to gravel ballast.

Weak ballast shoulders result in track that is out of cross level and line and this fact is very evident, especially in multiple-track districts where the outside track will settle out of line and cross level to the outside where ballast shoulders are weak. In single track territory a variation in cross level and line will develop on both sides of the track.

It is my opinion that well-graded gravel partially crushed, crushed stone or slag ballast (which, due to its consistency, has fewer voids than a ballast with large particles), provides more resistance to lateral movement since

the tie comes in contact with a greater number of ballast particles.

Another important factor is the height and width of the subshoulder on which rests the ballast beyond the ends of the ties. If subshoulders are low and narrow, the ballast at the ends of the ties is inclined to be vibrated down away from the tie ends more so than if the ballast shoulder was at the proper height and of sufficient width.

There are certain types of glacial gravel which have many marble-like particles that offer little resistance to lateral movement, except where wide ballast shoulders are used. It would appear that the slope of the ballast shoulders should not be less than two-to-one, but the width will depend upon the consistency or graduation of the ballast and its weight.

Preserves Good Surface

By H. S. ASHLEY
Assistant Engineer Maintenance of Way,
Boston & Maine, Boston, Mass.

If a proper shoulder is not provided at the time of reballasting or resurfacing, the line is soon affected, followed by a raveling of ballast at the ends of ties, all of which soon disturbs the surface of the track.

A standard shoulder similar in design to that recommended by the American Railway Engineering



Association should be formed immediately after track is tamped and should be reinforced from time to time as shoulder stone is used in spotting. This statement applies for all types of ballast regardless of whether it consists of stone, gravel, cinders, or what not.

Weight, Structure Important

By R. V. DANGREMOND
Roadmaster, Elgin, Joliet & Eastern,
Gary, Ind.

The importance of the ballast at tie ends in resisting the lateral movement of the track depends to a great extent on the type of ballast in use. In order to elaborate on this a little, it is necessary to describe some of the types of ballast in use on the American railroads and list them according to the relative merits of the materials for ballast purposes which, of course, includes their resistance to lateral movement of the track. Those in use include broken stone, disintegrated granite, broken slag, washed gravel, screened gravel, river gravel, chat, pitrun gravel, cinders, stone screenings, chert, sand, cementing gravel, and granulated slag.

The ballast material which in the greatest degree fulfills the requirement of resisting the lateral movement of the track with the least amount needed at the ends of ties is broken stone. Stone of good quality that is crushed from hard, tough rock will neither crumble nor be crushed into dust by traffic or by the usual amount of maintenance work. Its sharp corners grip the ties as well as interlock with adjacent stones in such a way as to hold the track firmly in line with a minimum amount required at the tie ends.

Disintegrated granite is the name given to large ledges of a special variety of granite rock occurring in various localities throughout the Rocky Mountain region, and in certain sections of the Sierra mountains. Masses of this rock, when moved or jarred, separate into cubical fragments varying in size from $\frac{3}{4}$ in. to $1\frac{1}{2}$

in. This material forms an almost ideal ballast. It weighs approximately 3000 lb. per cubic yard, is free from dust, drains well and does not heave with frost. It has angular surfaces which interlock but the edges do not cut even soft-wood fir ties. This ballast also supports the track firmly in line with a narrow tie-end ballast section.

Slag is a waste material or residue produced during the melting of ores at smelters or mills. Coarse slag affords a ballast material for holding track in line that is second only to the best grades of broken stone and consequently requires a relatively narrow shoulder at tie ends due to the sharp edges that interlock and hold the track at the bottom and sides of the ties.

Gravel ballast is nothing more than stone that has been broken up by natural forces and then by the action of water along the sea

or in streams. This material, because of its smooth surface and round form, does not bind or lock together as those previously mentioned and therefore requires a larger ballast section to keep the track in good alignment. Gravel as a ballast material can be improved by the addition of sand and gravel in the proportion of about $\frac{2}{3}$ large-size gravel with $\frac{1}{3}$ binding material. I have found it hard with even this mixture to hold track in good line unless the material at the tie ends is sufficiently wide in section to help hold the line against lateral motion by sheer bulk.

Chat is a species of ballast obtained from refuse piles of mills treating zinc or lead ore. It is the crushed and washed natural-stone portion of zinc-bearing and lead-bearing ores which has been discarded as not containing sufficient metal to be worth processing. This

material is quite heavy but ranges in size from $\frac{1}{4}$ in. down and does not tend to hold track in line too well without a wider shoulder section than the materials previously mentioned.

The other ballast materials listed, such as cinders, stone screenings, chert, cementing gravel and granulated slag all require wider tie-end ballast sections because they are comparatively light in weight and are rather fine-grained.

To summarize, the weight and structure of various ballast materials has a definite bearing as to the tie-end, ballast-resisting lateral movement of track, although types of traffic and weather conditions also must be considered when determining ballast-type requirements for good surface, drainage and frost problems as well as good track alignment.

Minimizing Wheel Damage to Stock Rails

What measures can be taken to minimize damage to "bent" stock rails by wheel treads? What are their relative advantages and disadvantages? Explain.

A Groove Multiplies Life

By A. F. HUBER

Chief Engineer, Ramapo Ajax Division, American Brake Shoe Company, Chicago

Stock rails are damaged principally by worn wheel treads, which are often termed "false flanges," when they cross-intersect the head of the stock rail diagonally. This occurs principally on the bent stock rail from main-line movements, which are always faster and generally in greater volume than the turnout movements. The speed and weight of modern traffic is such that the bent stock rail often requires renewal before the main-track switch point is worn out. Heavier and stiffer rail sections, and the firmer bracing now necessary to meet signal requirements, increase the stresses on the surface metal of the rail head and thus adversely affect this situation.

Full heat-treatment of stock rails or surface hardening of all or a portion of their length has been successfully used to retard the wear and batter caused by false flanges. Either process is also helpful to reduce the head flattening of bent stock rails subjected to excessively large turnout movements, such as in an entrance turnout into a yard.

One large railroad is specifying, on their bent stock rails, a groove about $\frac{1}{4}$ in. deep and 2 in. wide, spaced rail-head width from the gage line of the switch point. This provides a path for the false flanges and eliminates an abrupt lift of the wheel in facing-point movements, thus reducing the shock on the stock rail head. This road states that such channeling has increased the track life of the bent stock rails in main-line turnouts by several times.

Use Switch-Point Guards

By GEORGE S. CRITES

Division Engineer (Retired), Baltimore & Ohio, Baltimore, Md.

Stresses which damage bent stock rails are produced by the forces necessary to change the direction of wheels at the switch point for diverging movements. Few main-line turnouts are used to the extent that the stock rails receive much damage, but much-used, main-line switches should have a facing-point guard rail securely fastened to the bent stock rail ahead of the bend to guide and

direct wheels entering and leaving turnouts. Such guard rails reduce stresses in stock rails.

If these much-used turnouts are on curves, the turnout point can safely be set far enough ahead of its mate to allow for the facing-point guard rail to cover the bend in the stock rail and further reduce stresses in it and also protect the turnout switch point from wear. Some slight modifications in standard interlocked switch arrangements have to be made on account of the two points not being opposite each other, but this can easily be arranged.

For slow movements in yards, switch-point guards protect bent stock rails from wheel wear by placing the stresses caused by forces necessary to change the direction of wheels more in the guards than in the adjoining bent stock rail.

The simplest of such switch-point guards is a small weld of wear-resisting metal on the gage side of the head of the rail opposite the bend in the stock rail. Or the same effect can be secured by bolting a properly designed section of wear-resisting metal onto the rail opposite the bend in the stock rail. Such devices protect the turnout switch point from wear as well as reducing stresses in the bent stock rail.

A better and entirely effective, but much more initially expensive device, is a guard for the bend in the stock rail made of wear-resist-

ing metal which is fastened to the bent stock rail in an arrangement similar to the guard of a self-

guarded frog. Some such devices have been in use on heavy-duty turnouts for years and have pre-

vented damage to bent stock rails and undue wear of the turnout switch points.

Installing Pneumatic-Tube Systems

What major factors determine whether a pneumatic-tube system should be installed at a yard? Explain. What sizes and shapes of tubes are preferable for use at most yards? Why?

Operating Needs Determine

By W. W. PULHAM

Superintendent of Communications,
Denver & Rio Grande Western,
Denver, Colo.

Wherever operating conditions require the employment of messengers on a 24-hr. per day basis to handle waybills, consists, telegrams, and other record communications, present-day wage rates indicate the advisability of investigating the probable cost of substituting pneumatic-tube service. The major factors to be considered are, of course, the first cost of installation, interest on the investment, and the annual cost of maintenance, operation, and depreciation as compared with the recurring annual cost of messenger service.

The size and shape of tubes will be controlled by the type and quantity of communications to be moved in each transmission. When waybills are to be handled in average quantities, a 4-in. tube will usually meet the requirements. Here again first cost is a controlling factor because, as the size of the tube is increased, so does the first cost.

Another major item to be considered, and one that also has a bearing on first cost, is whether to install the pneumatic tube underground or to suspend it from

existing poles or structures. Each situation requires study, but, generally, mechanical handling of communications is much more satisfactory in all respects than manual handling.

Matter of Economy

By A. E. DE MATTEI

Superintendent of Communications,
Southern Pacific, San Francisco, Cal.

We consider the most important factor determining whether or not a pneumatic-tube system should be installed at a yard to be whether or not the tube system is economically justified. In other words, if the volume of waybills and other documents to be dispatched from one point in the yard to another is such that they can be handled with greater dispatch by pneumatic tube than by the use of messengers, and if the expense of installation can be justified by the savings realized by discontinuing messenger service, then a tube system should be installed.

With respect to the installation of a small tube such as would be used between a yard office and an adjacent yardmaster's tower, the matter of convenience is taken into consideration. It is the consensus of opinion at most yards that waybills

for one train should be dispatched in a single pouch. For this reason, we feel that a 6-in. pneumatic tube should be used between the receiving yard and the main yard office.

Large Size More Efficient

By A. M. BROWN

Manager of Commercial Sales,
The Lamson Corporation, Syracuse, N. Y.

The major factors to be determined in considering whether or not a pneumatic tube system should be installed at a yard is the balance of the expected saving in dollars per car handled, times the number of cars handled per year, balanced against the expected cost of the pneumatic tube system.

Cost studies show that one yard handling 3,000 cars per day showed a saving of 57,000 car-days per year using such a tube system. The more than 75 installations of pneumatic tube systems presently in use satisfactorily verify a very substantial savings.

Most of the earlier installations were of 3-in. and 4-in. diameter tube, but since 1927 most of the installations have been of 5½-in. tube, since the carrier used in this tube has about twice the capacity of that used in the 4-in. tube. The round tube has been found to be most satisfactory, although there have been one or two installations of oval tubing 4-in. by 7-in. in size.

With the 5½-in. carrier, train papers can be handled for better than 95 per cent of the trains with one or two carrier loads.

Chemical-Resistant Vinyl Finishes

What are chemical-resistant vinyl finishes? For what uses are they adaptable in connection with water, oil, and sanitation services on railways? How can they best be applied in such cases? Explain.

Best to Spray Them

By ALLAN PERRY

Product Information Service, Finishes Division, E. I. Du Pont de Nemours & Co., Inc., Wilmington, Del.

Chemical-resistant vinyl finishes are vinyl resins plus plasticizer dis-

solved in suitable solvents. Most of the products used for maintenance painting are pigmented with normal pigments and the products dry by evaporation of the solvents similar to lacquers. They provide durable, chemically inert films and are

recommended chiefly for maintenance painting where chemical resistance is required.

Normally we would not recommend them for the interior of a water tank. Asphaltum and bitumastic coatings are normally used for this purpose. As for oil-storage tanks, I question whether the type of oil used by the railroads would require a coating. As to sanitation services, it is quite possible that these products would hold merit, depending upon the type of exposure involved.

As to application, the preferred

method is by spray. Brush application is not desired chiefly because, when multiple coats of vinyls are applied by brush, the preceding coat partially dissolves and is picked up in the brush due to the nature of the solvents used in compounding these products.

Have Many Railroad Uses

By H. M. SCHUDLICH
Engineer of Water Service,
Northern Pacific, St. Paul, Minn.

There are now available for general use on practically all metals, whether clean or corroded, on wood, and on damp or dry concrete, a class of protective materials broadly classified as vinyl finishes. These materials, although thought of as paints because they are brushed, sprayed or dipped, are in a true sense plastic films. They are resistant to attack by acids, salts, alkalis, oil and aggressive waters and therefore provide lasting protection to properly treated surfaces. These films are likewise fire resistant or retardant since they do not support combustion.

There are many vinyl resins, but for practical purposes the most common type is a copolymer of acetate and chloride combined with suitable stabilizers and plasticizers along with compatible pigments and solvents. Also available is a vinyl copolymer wash primer which, when properly formulated with suitable pigments, offers excellent surface protection due to its impermeability, high resistance to abrasion and great adhesive property.

This material provides a lasting base for plastic and other types of protective coatings. Since the polyvinyl coatings dry by solvent evaporation rather than oxidation, the applied coating is dry and ready for service or further coating within a period of one to four hours. Therefore, out-of-service time is minimized, and this feature alone may be the decisive factor in considering the use of the vinyl type finish over an oil type of coating.

Labor costs for surface preparation and application of protective coatings exceed by three to six times the cost of the coating material. Therefore, it can be very uneconomical to consider the use of improper material or the use of unsuitable material for a specific purpose. Thought should be given to

those situations where unusual protection is desired to provide a coating with resistivity to moisture and chemical activity. Temperature conditions should also be considered, as vinyl coatings usually can be dependable up to 160 deg. F. and some formulations as high as 200 deg. F.

As with paint, vinyl-resin coatings usually require a prepared surface, and the time required for cleaning will result in long life. Obviously the surface should be free from loose material, partially adhered rust or other oxide, dirt and soil, as well as oil and grease. When used on concrete the surface should be acid etched to remove free alkali, loose particles and to provide a roughened surface. Wood should be free from resinous and oil spots, clean and dry and it sometimes requires the application of special primers.

Are Versatile Coatings

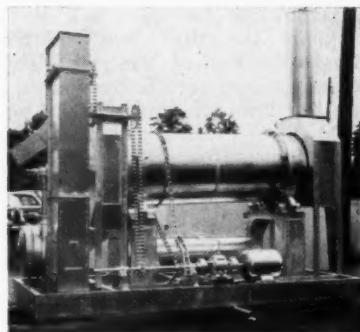
When reviewing the properties and advantages of vinyl coatings, those in charge of maintenance can readily recognize that it will be a suitable material for the protection of many facilities that offer difficulties from corrosion, such as brine tanks and piping for sodium zeolite softeners, piping and concrete around demineralizing plants, where both acid and alkalis are used for regeneration, equipment and premises around hypochlorinators and chlorinators, especially in the presence of sweating due to humidity, and car washing equipment and piping as well as the concrete drainage sumps where acidic-type cleaners are used. Very frequently these compounds contain non-ionic surfactants which cause the acid to creep into the smallest pores and cracks after which disintegration will be very complete. Cooling towers and spray-pond piping are readily susceptible to active corrosion. These are but a few of the suggested railway uses for this material and under unusual conditions the manufacturer will give suggestions for proper application.



RAILWAY TRACK and STRUCTURES

PRODUCTS OF MANUFACTURERS

New, improved equipment,
materials, devices



DRYER FOR LOCOMOTIVE SAND

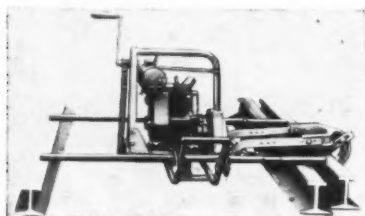
THE WHITE Manufacturing Company, Elkhart, Ind., has announced the availability of its Model K-5 aggregate dryer to the railroad industry for drying locomotive sander sand. The dryer, of the rotating drum type, is rated at a capacity of six tons per hour figured on initial moisture of 5 per cent and discharge temperature of 250 deg. above atmospheric. The dryer drum, 36 in. in diameter and 8 ft. long, is mounted on self-aligning roller bearings and is driven by a 10-hp. electric motor. The unit is equipped with a low-pressure air blower and can be operated by either oil or natural gas. The Model K-5 can be equipped with any desirable type of loading elevator, or fed from bins. The dryer shown in the accompanying illustration is mounted on a base 14 ft. long and 5 ft. 6 in. wide. Overall height is 19 ft. 9 in. The manufacturer points out that these dimensions can be changed somewhat to suit individual requirements. Total weight of the dryer is 8,000 lb.

IMPROVED TRACK DRILL

EASIER drill spotting, more accurate drilling and longer unit life are said to be a few of the benefits.
(Continued on next page)

For additional information on any of the products described on these pages, use postcards, page 677.

fits resulting from new improvements made in the Buda power track drill, according to the Buda Company, Harvey, Ill. An insulated support and locator group, consisting of telescopic arms and attachments, has been added to support the drill between the tracks on top of the rails. This eliminates the need to block up the drill or level off the ballast to get true, level holes. Drilling can be accomplished on all sizes of rails.

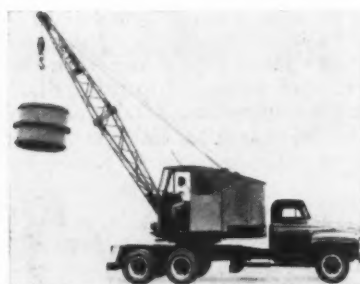


The support arms telescope to 45 in. They are detachable, making the entire drill portable.

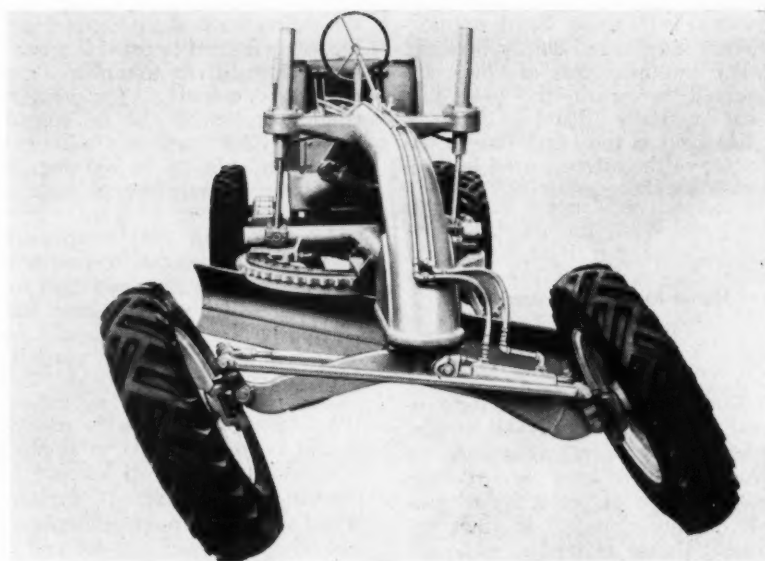
The Buda support and locator group is also available for use with Buda power track drills now in the field. The manufacturer has lengthened the two-position hook to make it as easy to drill filler blocks as rails. This hook has a safety overclutch for quick release of the drill from the rail. Other new features include a welded steel housing on final drive and an improved feed screw mechanism.

NEW 6-TON TRUCK CRANE

THE THEW Shovel Company, Lorain, Ohio, have announced the availability of a new 6-ton truck crane, designated as Lorain Model TL-10. The unit consists of a com-



plete superstructure equipped as a lifting crane which can also be used as a $\frac{3}{4}$ -cu. yd. dragline or clamshell.



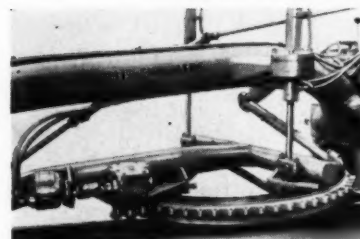
FRONT WHEEL lean (above), and power circle turn now being offered for use with the Allis-Chalmers Model D grader.

NEW ACCESSORIES FOR MOTOR GRADER

FRONT-wheel lean and power circle turn are now being offered as optional equipment for the 40-hp., tandem-drive Model D motor grader, manufactured by the Tractor division of the Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Mechanism for the front wheel lean includes axle and steering knuckles, additional tie bar, and wheel-lean cylinder. The wheel lean has a range of 25 deg. each way, comparable in design to that in the 104-hp. Model AD-40 motor grader. This feature is said to give ample range for ditching and for counteracting side draft. Front axle has the same high arch for clearance as on the standard Model D—15 $\frac{5}{16}$ in. with 6.50—16 tires and 19 in. with 7.50—16 tires. Axle tilt is 15 deg.

Wheels are leaned by moving a valve control lever. When the control is in neutral position the wheels stay in position any place in their full 50 deg. range. No locks are required. The manufacturer claims that blade maneuver-



ability is increased since the front of the Model D can be moved over more than a foot by leaning the wheels.

The power circle turn is operated by a hydraulic motor and reduction gear and includes a new circle. Self-cleaning teeth mounted on the outside of the circle, and self-locking reduction gears of the same design as on the AD-40, are used on the Model D. The new circle is designed to provide the same three-point mounting and provision for adjustment as on the standard Model D and other A-C motor graders. The circle turn provides precision control with a wide range of settings through its 135 deg. The manufacturer claims that, when finishing subgrade or black-top, the moldboard can be rotated without disturbing the road surface and the toe of the blade can be swung well inside the front tire to give sufficient range for ditching.

It is designed primarily for mounting on a suitable new or used truck furnished by the user. However, the manufacturer points out, it has many other applications such as mounting on piers, barges, bins, docks, trailers, flat cars, etc. The

TL-10 incorporates oil-enclosed gears, anti-friction bearings, interchangeable clutch shoes, safety glass windows, and lights. It is a two-drum, gasoline-powered machine, equipped with a 25-ft., two-

(Continued on page 676)

"Well . . . It's Really Something!"

"THE JOB THAT YOU DID FOR US IN 1952—ON BRANCH LINES—WAS NOT TOO IMPRESSIVE. BUT I RECENTLY INSEPECTED THE SAME LINES . . . WELL, IT'S REALLY SOMETHING! NOTHING IN THE WAY OF GROWTH IN THE NEW GROWING SEASON."

Commenting further this maintenance engineer said:

"You know our branch lines last year were so heavily grown that the rails were barely visible. Nothing had been done to discourage vegetation on that territory for many years."

"You recall, we made a fall survey of these areas and your representative conceded that the kill was about 85%."

"On June 1st I inspected these branch lines. I wanted to know if your product really had any carry over benefit into a new growing season. To say that I was pleased hardly does the situation justice. The ballasted area that we treated showed up quite bare of any vegetation."

"I intend to study the areas from time to time to observe if and when new plant life appears in the growing season of 1953."

This frank statement reflects what is apt to be the conclusion of many maintenance engineers. They think in terms of a quick kill. If plant life of different types survives, they are apt to conclude that the chemical lacks potency. Actually, some chemicals are purposely made

slow acting. And, in fact, a chemical that is slow in its action of killing and of retarding new growth, is apt to be more satisfactory than one that works rapidly, shows up well in a few days time, but where regrowth comes in at an early date.

IT IS LONG RANGE BENEFITS WHICH PAY OFF WHEN MONEY IS SPENT IN WEED AND BRUSH CONTROL WORK ON RAILROAD RIGHT OF WAY.



THE READE MANUFACTURING CO., INC.

CHEMICAL WEED KILLERS

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Works:

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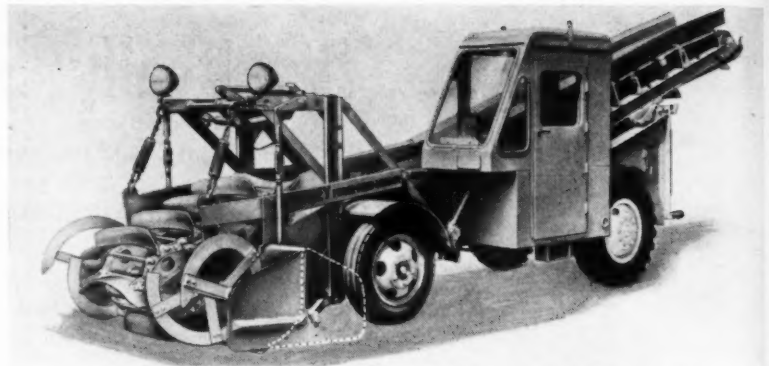
For additional information on any of the products described on these pages, use postcards, page 677.

piece, butt-flange connected boom. Center sections are available for extending the boom to 45 ft.

Tagline for clamshell service, fairlead for dragline service, precision power boom lowering device and other extras are available. The machine has drop-forged turntable rollers, machine-cut ring gear teeth, machined turntable roller flanges, and 3-in. wide shoe-type clutches. No laggings are required on the two 12-in. pitch diameter hoist drums that hold 200 ft. of ½-in. cable each. The 8-in. pitch diameter boom hoist drum has a takeup reel for reeling by power and storing up to 100 ft. of excess hoist cable resulting from change of boom length—thus eliminating the necessity for a floating harness.

STOCKPILE ATTACHMENT FOR ATHEY LOADER

A NEW high-speed stockpile loading attachment has been developed by the Athey Products Cor-



poration, Chicago, for its Model 3 Force-Feed Loader. The new attachment is said to be ideally suited for loading such material as coal, gravel, crushed stone, coke, dry chemicals, or any free-flowing stockpiled material.

Designated the "Bulldozer Moldboard-Auger Feeder," the attachment is available either as original equipment on loaders shipped from the factory or as an attachment which can be installed on machines already in the field. The attachment includes a bulldozer type moldboard which ex-

tends across the loader to provide a 90 in. width of gather and has positive hydraulic down pressure on reversible cutting edges.

A special feature of the "Bulldozer Moldboard-Auger Feeder" are the side boards at each end of the moldboard. These sideboards may be reversed, as shown in the illustration, for loading from windrow or set as shown by the dotted lines for loading from stockpile. When set for stockpile loading the sideboards prevent material from building up in front of the front wheels.

300 pounds

or

20,000 pounds

each hour

Any Amount • Any Type

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PATCH MATERIAL

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AURORA, ILLINOIS, U. S. A.




MATERIAL TRANSPORTER

THE SCOOT-Crete material handler, manufactured by the Getman Brothers Manufacturing Division, South Haven, Mich., has recently been introduced into the railroad field. This machine, which can be used with either a flat platform or manually-operated dump box, is available in several sizes and models to meet a variety of needs.

The Model N52 (shown in the accompanying photograph) is powered, as are other models of the Scoot-Crete, by a Wisconsin air-cooled, gasoline engine and features a five-speed truck-type transmission, caster steering, positive braking and other features. The Model N52 will handle a recommended load of 2,500 lb., and is said to be capable of ascending a 25 per cent scaffold grade.

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ARMCO LINER PLATES



THE MONTH'S NEWS

Railway Personnel

General

LeRoy McClain Elledge, assistant superintendent on the Missouri Pacific at Kansas City, Mo., and an engineer by training and experience, has been promoted to superintendent of the Eastern division at Kansas City.

Frederick N. Nye, assistant to vice-president, finance, of the New York Cen-

tral, and an engineer by training and experience, has been appointed to the new position of director of transportation research with headquarters as before at New York.

A. H. Woerner, superintendent of the St. Louis Division of the Baltimore & Ohio at Washington, Ind., and an engineer through training and experience, has retired after 43 years of service. Mr. Woerner began his railroad career with the B&O in January 1910 as a rodman in the engineering department at Pittsburgh, Pa. In 1915 he was promoted to assistant division engineer at Connellsville, Pa., and in 1918 was named division engineer at Wheeling, W. Va. After serving as di-

vision engineer on the St. Louis division and on the Chicago division, Mr. Woerner was appointed superintendent of the Indianapolis division at Indianapolis, Ind., in 1942, and in July of that year was transferred to Washington—the position he held at the time of his recent retirement.

Nathan L. Fleckenstine, who was recently promoted to superintendent of the Panhandle division of the Pennsylvania at Pittsburgh, Pa. (RT&S, May, p. 492), was born at Orangeville, Pa., on November 4, 1911, and received his Bachelor of Science degree from Carnegie Institute of Technology in 1933. Following service on the surveying corps for the Pennsylvania State Highway Department and the Pennsylvania State Forestry Department, Mr. Fleckenstine joined the PRR in April 1934 as an assistant on the engineer corps at Mansfield, Ohio, in which capacity he subsequently served at various locations. On January 1, 1936, he was promoted to as-

Five years later —

Libbey-ZONE Process Bridge Applications Still in Perfect Condition!



1948—The Libbey-ZONE application to this railway trestle has just been applied as a test installation.

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THE ZONE COMPANY

Rail Products Division • Box 789 • Fort Worth 1, Texas



Nathan L. Fleckenstine

stant supervisor of track at Elmira, N. Y., later transferring to Rochester, Pa., and to New York. Appointed supervisor of track on June 10, 1940, he held that position consecutively at Mt. Morris, N. Y.; Piqua, Ohio; and Cresson, Pa. On January 1, 1947, he was named assistant division engineer, assigned to special duty in the office of the superintendent of stations and transfers, and six months later was transferred to Baltimore, Md. Mr. Fleckenstine received his appointment as division engineer on September 1, 1947, and served in that capacity, successively, at Grand Rapids, Mich., and Baltimore, until February 1, 1952, when he was assigned to special duty in the office of vice-president, Eastern region; the position he held at the time of his recent promotion to superintendent.

Engineering

R. H. Beeder, assistant to the chief engineer of the Atchison, Topeka & Santa Fe System, has been promoted to assistant chief engineer, with headquarters as before at Chicago.

Ralph Jones, roadmaster, has been promoted to assistant division engineer.

(Please turn to page 682)

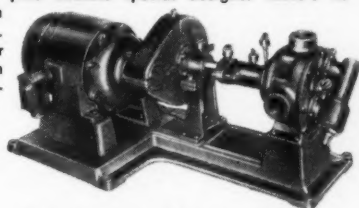
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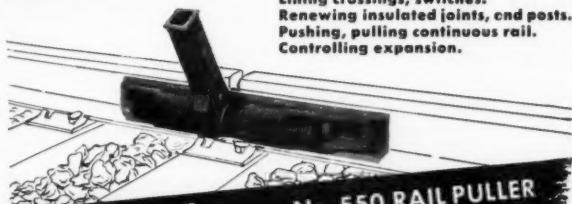
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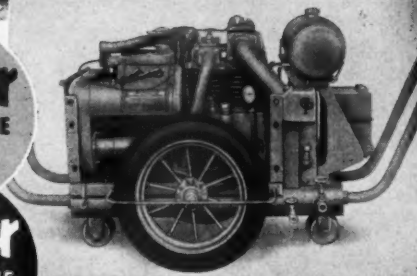
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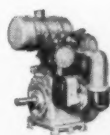


Outstanding features of the "Patrol" Compressor, built by Chicago Pneumatic Tool Co., N.Y.C., become even more impressive when you realize how the features of its Wisconsin Heavy-Duty Air-Cooled Engine contribute to them. First of all, compressor and engine cool by air alone . . . no water systems to leak, freeze or fail.

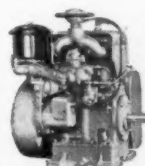
Overall, the unit is light and compact for easy mobility . . . a characteristic augmented by the lighter weight Wisconsin Engine. Yet the Wisconsin develops 50% more power than the compressor ever needs...for high-level performance in highest altitudes or tropic heat.

Also, the "Patrol" Compressor is a better unit, due to such additional Wisconsin features as thrust-absorbing tapered roller bearings at both ends of the crankshaft and unmatched ruggedness, top to bottom . . . the kind that makes light of heavy work.

Write for details about 4-cycle single-cylinder, 2-cylinder and V-type 4-cylinder models, 3 to 36 hp.



3 to 9 hp.
single-cylinder models.



7 to 14 1/2
2-cylinder models.



15 to 36 hp. V-type
4-cylinder models.



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Proved: Thousands of Aladdins are in use all over the world on main lines...in yards...under one or two-way traffic...in climates from 120 in the shade to 20 below. For further information, write for Bulletin C.

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Railway Personnel (Cont'd)

E. W. Smith, chief clerk to the chief engineer of the St. Louis-San Francisco at Springfield, Mo., has been appointed assistant to the chief engineer.

F. J. Hoberg, engineer in charge of the office of the chief engineer of the Pennsylvania at Chicago, has been appointed assistant engineer.

J. W. Hale, assistant to general manager of the Atlantic Coast Line, and an engineer by training and experience, has been appointed engineer assistant to general manager with headquarters continuing at Wilmington, N. C.

L. G. Reichert, office engineer of the Great Northern at St. Paul, Minn., has been appointed engineer at Duluth, Minn., succeeding E. E. Adams who has retired. W. H. Gordenier, chief draftsman in the engineering department at St. Paul, has been promoted to office engineer, succeeding Mr. Reichert.

K. Vavasour, assistant engineer on the Edmundston division of the Canadian National, has been promoted to the new position of assistant division engineer on that division, with headquarters as before at Edmundston, N. B.

J. H. Mercer, assistant supervisor of track on the New York Central at Lackawanna, N. Y., has been promoted to assistant engineer on the Buffalo division at Buffalo, N. Y., to succeed J. B. Delitsch, who has retired after 47 years of service.

Track

Donald C. Warner, transitman on the Eastern Division engineering corps of the New York Central, has been promoted to assistant supervisor of track on that division with headquarters at Brewster, N. Y.

B. H. Price, Jr., has been appointed assistant supervisor of track on the Bessemer & Lake Erie at Greenville, Pa., to succeed C. W. Morrison, who has been promoted to supervisor of track at Greenville.

Robert Stewart, assistant supervisor of track on the New York Central at Remsen, N. Y., has been transferred to Fonda, N. Y. Edward A. Smyntek, has been appointed assistant supervisor of track at Lackawanna, N. Y., to succeed J. H. Mercer, who, as announced elsewhere in these columns, has been promoted to assistant engineer at Buffalo, N. Y.

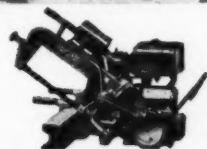
J. K. Hite, assistant supervisor of track on the New York division of the Pennsylvania at Jamesburg, N. J., has been transferred to the Pittsburgh division at East Liberty, Pa., to succeed Luke Jones, who has been promoted to supervisor of track on the Eastern division at Toledo, Ohio. R. L. Stevens, junior engineer at Pittsburgh, Pa., has been advanced to assistant supervisor of track on the Susquehanna division to replace M. W. Krug, who has been transferred to the Middle division.

(Please turn to page 684)

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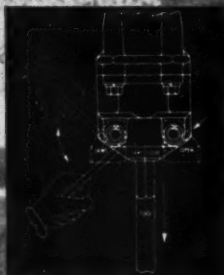


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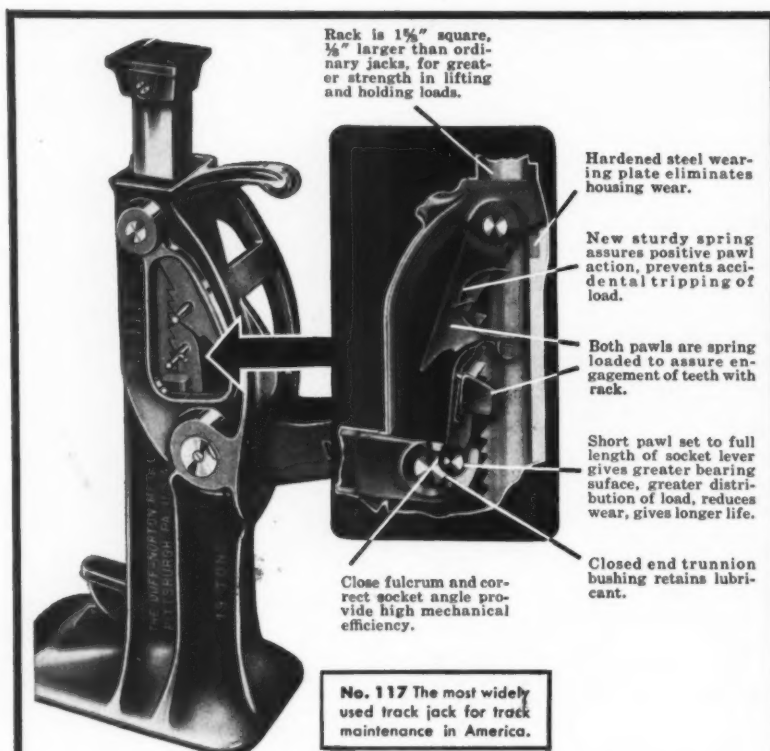
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Railway Personnel (Cont'd)

E. N. Bordwell has been appointed roadmaster on the Northern Pacific at Spokane, Wash., succeeding E. M. Overlie who has been named division roadmaster at Duluth, Minn. Mr. Overlie succeeds R. E. Schuette, who has been promoted to trainmaster-roadmaster at Bemidji, Minn., succeeding M. R. Smith, who has retired at his own request. W. D. Gray has been named roadmaster at Pasco, Wash., succeeding R. E. Hom who has been transferred. J. S. Mootz has been appointed assistant roadmaster.

L. E. Brault, supervisor of track on the Vicksburg district of the Vicksburg division of the Illinois Central at Baton Rouge, La., has been transferred to the Springfield division at Decatur, Ill., succeeding T. A. Winborn, who has been transferred to the Baton Rouge district of the Vicksburg division at Baton Rouge. Mr. Winborn succeeds J. A. Dumas, who has been transferred to the Vicksburg district of the Vicksburg division at Baton Rouge replacing Mr. Brault.

Water Service

Donald C. Teal, assistant engineer water supply on the Chesapeake & Ohio, has been promoted to superintendent of water supply with headquarters as before at Richmond, Va., to succeed R. C. Bardwell, who has retired (RT&S, June, p. 590). James T. McGuire, supervisor of water supply at Russell, Ky., has been appointed supervisor of water supply for the Cincinnati division at Covington, Ky.

Mr. Teal joined the C&O in 1924 following graduation from Purdue university and two years service with the Baltimore



Donald C. Teal

& Ohio as an instrumentman at Peru, Ind. He was promoted to assistant cost engineer at Clifton Forge, Va., in 1927, and in the same year moved to Richmond as field draftsman. He was appointed assistant engineer in 1929. During World War II, Mr. Teal served five years in the Army's Sanitation Corps and was a major when he was separated. He returned to the C&O in 1946 as system sanitary engineer, and was named assistant engineer water supply in 1951.

Bridge and Building

C. M. Setzer, supervisor of bridges and buildings on the Southern at Rock Hill, S. C., has been transferred to Charleston, S. C.

Special

James C. Ryan, superintendent maintenance equipment of the New York Central, Lines West of Buffalo, has been appointed to the newly created position of superintendent maintenance equipment-system. Harry C. Nordstrom, superintendent maintenance equipment, Buffalo and East, has been appointed assistant superintendent maintenance equipment-system. Both will have headquarters at New York.

Obituary

H. M. Smith, retired roadmaster on the Pocahontas division of the Norfolk & Western, died recently at the age of 76.

Cyrus P. Howes, retired bridge engineer for the Texas & Pacific, died recently at his home at Dallas, Tex., at the age of 71.

A. H. Deno, supervisor of bridges and buildings on the Chicago & North Western, with headquarters at Green Bay, Wis., died on June 18.

Association News

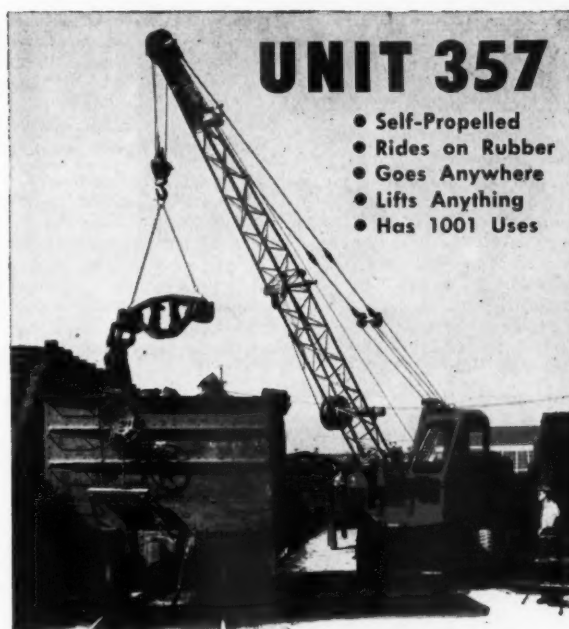
Bridge & Building Association

A meeting of the Executive committee was scheduled to be held at the Chicago Engineers Club on July 10. The main item of work on the agenda will be the reading and approval of the reports of the associations seven subjects committees, which are being prepared for presentation at the annual convention on September 15-17 at the Conrad Hilton Hotel, Chicago. It was expected that the Executive committee would also go over plans for the convention program in addition to conducting routine business.

Roadmasters' Association

The next meeting of the Executive committee will be held at the Chicago Engineers Club on July 13 under the direction of President R. H. Gilkey. The purpose will be to review those reports of subject committees that were not considered at the last previous meeting. Also, the Executive committee will review final plans for the annual convention to be held September 15-17 at the Conrad Hilton Hotel, Chicago.

(Please turn to page 686)



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Association News (Cont'd)

American Railway Engineering Association

The following three committees have scheduled meetings to be held during the month of July: The Committee on Water, Oil and Sanitation Services will meet July 14 in Room 1218 at association headquarters, Chicago; the Committee on Iron and Steel Structures has scheduled a meeting at Boston, Mass., to be held on July 16 and 17; and the Committee on Economics of Railway Labor will hold a meeting at the Shamrock Hotel, Houston, Tex., July 21 and 22.

Arrangements have been made for this committee to make an inspection trip over the Santa Fe near Houston on the 22nd.

Track Supply Association; Bridge & Building Supply Association

The boards of directors of the Track Supply Association and the Bridge and Building Supply Association will meet early in July to complete plans for their joint exhibition to be held September 14-17, 1953, at the Coliseum, Chicago, during the conventions of the Roadmasters Association and the American Railway Bridge and Building Association. They will also arrange for the annual

banquet which they will tender on Wednesday, September 16, at the Conrad Hilton Hotel to the members of the two railroad associations.

Indicating a desire on the part of the member companies of these supply associations to be of the greatest service to maintenance officers in the solution of their problems, 119 companies will use 264 booth spaces to display their latest developments in track materials, tools and work equipment. Many new exhibitors whose products will be shown for the first time at this September meeting will lend added interest, resulting in a show that in scope and amount of space used will exceed any previous exhibit held by these associations.

With some space still available, companies that desire to take part in the exhibition should address Lewis Thomas, director of exhibits, 59 E. Van Buren Street, Chicago.

(Please turn to page 688)

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 15-17, 1953, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 16-18, 1954, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

Mississippi Valley Maintenance of Way Club—P. E. Odom, Secretary-Treasurer, Room 1008, Frisco Building, 906 Olive Street, St. Louis 1, Mo.

National Railway Appliances Association—J. B. Templeton, Secretary, 1020 So. Central avenue, Chicago 44; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association—Annual meeting, October 14-16, 1953, Biltmore Hotel, Atlanta, Ga. Roy M. Edmonds, Secretary-treasurer, 1221 Locust Street, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 15-17, 1953, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn Street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

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Lumber
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PORTABLE FLEXIBLE SHAFT GRINDER

The RTW Model P-22 Grinder, designed for free hand grinding of surface welds on rail ends, crossings and frogs, also for flange ways, switch points and stock rails.

The unit consists of an air cooled gasoline engine, with a V-belt drive from the engine shaft to a counter shaft, to which is coupled a flexible shaft. The counter shaft is mounted in a housing on ball bearings and packed with grease and well protected from dust.

Engine and drive, mounted on a one wheel carriage, on a ball-bearing swivel plate, permitting free movement of the motor to facilitate handling of flexible shaft.

Either straight or cup grinding wheels operate at suitable speeds for high speed grinding. Governor adjustment on engine, regulates speed of the wheel, so as not to exceed the maximum speed permissible under the code for high speed wheels. Substantial guards are provided to meet all safety standards.

The carriage with handles for pushing it along from place to place and a locking device on the base plate is provided to prevent swiveling when moving the entire unit.

This unit is designed for operating auxiliary attachments—which quickly slip into the flexible shaft, such as straight wheel, cup wheel, cross cutter and track drill.

Machine can, if desired, be furnished with an electric motor.

For complete information on this or any other RTW Track Maintenance Equipment write to

Railway Trackwork Co.

3207 KENSINGTON AVE., PHILADELPHIA 34, PA.

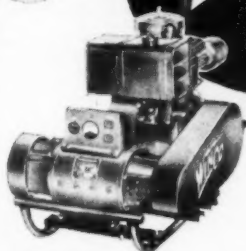
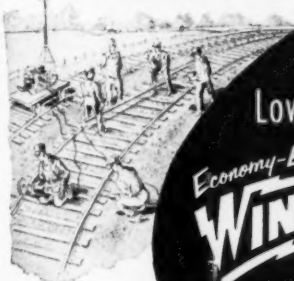
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Rail Grinders—Switch Grinders—Cross Grinders—Surface Grinders—Rail Drills—Track Liners—Ballast Extruders—Bit Sharpeners—Tie Nippers—Grinding Wheels—Cut-off Wheels

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Economy-Engineered

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Reduce maintenance costs with portable electric power to operate drills, saws, vibrators, tampers, nut trimmers, impact tools, grinders and wrenches. These new WINCO Generators are lightweight for easy portability—so sturdy they can "take it" on-the-job anywhere, anytime!

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WINCO ENGINE GENERATORS

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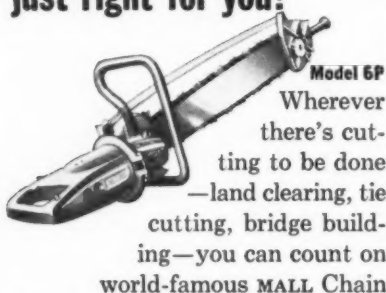
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Model 5P

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—land clearing, tie
cutting, bridge build-
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☐ Rail Maintenance Equipment

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Railroad Dept. _____

Company _____

Address _____

BU-35

Association News (Cont'd)

Metropolitan Maintenance of Way Club

The annual outing of the club was held on June 4 at the Out O' Bounds Aero & Golf Club, Suffern, N. Y., with 267 members and guests in attendance. The program included such sports as softball, horseshoes, quoits and golf, and prizes were awarded the winners in all activities. A buffet luncheon was served at 1:30 p.m.

M/W Club for Twin Cities

A concerted movement is now underway to organize a maintenance of way club in the Twin Cities area. As the first tangible step in this direction a preliminary meeting of railway maintenance officers and representatives of interested supply companies was scheduled to be held at the Midway Civic Club, St. Paul, at 6:00 p.m. on July 13. Thomas R. Klingel, principal assistant engineer, Soo Line, had been designated as temporary chairman to preside at the meeting. It was expected that there would be available at the meeting expressions of opinion from top engineering and maintenance officers in the Twin Cities area indicating that they were generally in favor of the organization of such a club. The objec-

tive was to progress the organizational work with the thought that the new club could start holding regular meetings in the fall of this year.

Supply Trade News

General

R. G. LeTourneau, Inc., has announced that its headquarters, formerly located at Peoria, Ill., have been transferred to Longview, Tex.

Personal

Clarke Tryon has been named sales manager of Ramset Fasteners, Inc., Cleveland, Ohio, division of Olin Industries, Inc., East Alton, Ill. Mr. Tryon will make his headquarters at Cleveland.

Carl D. Franks, executive vice-president of the Portland Cement Association, Chicago, has been elected president, succeeding the late Frank T. Sheets. Donald Kennedy has been named executive vice-president, succeeding Mr. Franks, and E. F. MacArthur has been named treasurer, succeeding A. B. Stall, who died in February of this year.

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HYDRAULIC

SAVES TIME MANPOWER EXPENSE

Here's the answer wherever economy in light earth-moving operations is essential! The new High Lift Hydraulic "Agricat" gives low-cost, low-maintenance loading... plus superior performance in those cramped, hard-to-get-at-places. Its five cubic foot capacity permits

loading a 2-yard dump truck in ten minutes. Steel welded construction, with high carbon cutter bar and ripper teeth, means years of trouble free service. See the new High Lift Hydraulic "Agricat" now! Sales job demonstrations are available by appointment.

EARL H. PENCE & CO., INC.

2150 Washington Avenue • San Leandro, California • TRinidad 2 4474

R. M. Killey, eastern district manager of the Wood Preserving Division of Koppers Company, Inc., has been named to the newly created position of manager of timber operations, with headquarters as before at Charleston, S. C. J. E. Younkin, Pittsburgh district manager for the Wood Preserving Division, has succeeded Mr. Killey as eastern district manager. D. A. Mitchell, superintendent of plants for the division, has been named Pittsburgh district manager, succeeding Mr. Younkin. E. R. Snodgrass, chief engineer of the division, has been appointed general superintendent, succeeding Mr. Mitchell.

L. E. Brown, sales engineer for the Reliance Division of the Eaton Manufacturing Company, Massillon, Ohio, has been promoted to Detroit district sales manager, with headquarters at Detroit, Mich. William R. Chandler, Tom L. Hunter and William McCormick have been appointed sales engineers for the Reliance Division.



L. E. Brown

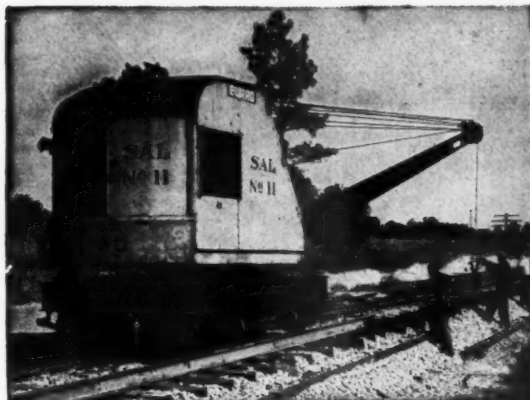
Mr. Brown, who has represented Reliance in the Detroit area since 1928, succeeds H. R. Hanna, who passed away April 13, 1953.

G. R. Betts, manager of railroad sales of the O'Neill Division of Armco Drainage & Metal Products, Inc., has been appointed sales manager of the division, with headquarters at South Bend, Ind. Herbert Clark, Jr., sales engineer, in the railroad sales department, has been appointed acting railroad sales manager to succeed Mr. Betts.

(Please turn to page 690)



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We call Burro Cranes "Railroad Specialists" because they do so many railroad jobs so well. Track work, bridge work, bulk materials handling, Mechanical Stores Department, material handling with or without magnet, are only a few jobs Burro does with speed and economy. Burro Cranes are designed for railroad work—not adapted to it. Watch a Burro work and see why it's called on to do so many jobs by most of the country's railroads.

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Specialist

Only
Burro Cranes Have:

- Fast travel speeds—up to 22 M.P.H.
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- Elevated Boom Heels for working over high sided gondolas.
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Burro WORK Power
means more
EARNING Power

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For sheds, platforms and all wood construction

Sheds and platforms need the clean, dependable protection PENTA gives. It penetrates deeply for lasting protection, doesn't leach out, yet costs no more than other types of wood preservation. Wherever you use wood—for sheds

and platforms, or other wood construction—you'll find it pays to specify pressure treatment with Chapman PENTA petroleum solutions. Write today for names of companies supplying PENTA pressure-treated forest products.

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Penta Preservative

Conforming to A.W.P.A. Specification P8 and P9

For additional information, use postcard, pages 677-678

JULY, 1953 689

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POWER CONTROL
WEAR CONTROL

- NO JERKING, slip-clutching or racing engines!
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608 SOUTH DEARBORN STREET • CHICAGO 5, ILLINOIS

• PATENTED

Supply Trade News (Cont'd)

Lawrence F. Bennett, formerly associated with the Denver & Rio Grande Western, has been appointed sales engineer for the Taylor Fibre Company, Norristown, Pa.

Kenneth B. Larkin has been appointed district representative in Sales Territory No. 7 of the Frank G. Hough Company, Libertyville, Illinois. Mr. Larkin, whose new territory includes the states of Washington, Oregon, Idaho, Montana and the Canadian provinces of British Columbia, Alberta and Saskatchewan, succeeds H. E. Thomas, who has been named district representative of Sales Territory No. 1, comprising the states of Illinois, Michigan, Indiana, Ohio, Kentucky and Eastern Missouri.

Obituary

George M. Hogan, Chicago, a manufacturers' representative in the railway supply field, died on June 4 after a long illness.

George L. Moore, retired president of the Moore & Steele Corp., Owego, N. Y., died recently.

Trade Publications

(To obtain copies of any of the publications mentioned in these columns, use postcards, page 677).

Athey Loader—Complete description, specifications and pictures of the Athey Model 3 Force-Feed Loader are now available in a new 8-page bulletin recently published by the Athey Products Corporation. The booklet describes loader attachments for stockpile loading, snow removal and for work with the Athey portable breaker. Complete operating specifications are presented in the two-color book which is illustrated with on-the-job action photographs.

Floor Patching—The Master Builders Company, Cleveland, Ohio, has recently published two pieces of literature dealing with the repair of floors using "Masterquick" iron-aggregate patching material. One of these consists of a large, two-color chart which shows pictorially the methods to be followed in patching floors with Masterquick. The other is made up in the form of a six-page folder which points out the advantages of this particular type of floor patching material.

Track Material—Catalog No. 575 A, entitled "Switch Materials," has been issued by the L. B. Foster Company. Included in the 44-page, 8½-in. by 11-in. catalog are illustrations, descriptions and specifications of crossings, frogs, gage plates, guards, rails, guardrail clamps, heel blocks, rail braces, slide plates, combination slide plates and braces, spring connecting rods, spring head rods, switch lugs, switch rods and bars, transit clips and rods, twin tie plates, switch points, switches and stands, switch materials for light rail installations, turnouts and timber requirements.

THE NORDBERG *Power* RAIL DRILL...

gives you **ALL** the features you want...

THE net results of *all* the features of the Nordberg Model CD Rail Drill can be summarized by simply stating that these modern, efficient machines will drill a $1\frac{1}{8}$ inch hole in less than one minute . . . and at savings of up to \$1.80 per hole, as compared to hand drilling methods.

Can you actually *afford* to waste valuable man hours by drilling bolt holes in rail by hand methods? Get further details by writing for Bulletin 204.

- Easily set up. Machine is supported on the rail and not on ties and ballast.
- Weighs only 132 pounds.
- All bearings are of anti-friction type, requiring minimum maintenance.
- Chuck automatically grips flat drill bit and is positively held in drill spindle. No threads to fail or be damaged. No tools required to install drill bit or chuck. Both can be removed by the tap of a hammer.
- Stabilizing bar with cam action maintains drill in level position on various rail heights.
- Simple adjustment raises or lowers drill bit with reference to top of rail, utilizing a wing nut and locking lever.
- Wide spread of 14" between rail fork and drill permits drilling at heel blocks, switches and guard rails in track.
- High speed crank quickly moves drill up to rail for drilling.
- Ratchet feed handle permits manual control of the feed.
- Ample power provided by $1\frac{3}{4}$ H.P. air cooled gasoline engine with 6 to 1 gear reduction.



Use NORDBERG *
"Mechanical Muscles"
to do a Better, Faster
Maintenance Job
at Lower Cost . . .

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Nordberg Rail Drill Bit Sharp-
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Bulletin 192.

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HIGHEST OUTPUT per pound!
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For standby, portable, mobile, stationary use

Whatever your need for electric power, the new Onan CW—5 and 10 give you top performance and value! Here, for the first time, are 5 and 10KW electric plants powered by revolutionary, new air-cooled gasoline engines, designed and built by Onan exclusively for electric plant use.

Both engines are 1800 R.P.M. Weigh much less than general-purpose engines. Amazingly compact. Two-cylinder, alternate-firing for smooth power. Built to deliver dependable service in heavy-duty use. New, quiet, highly-efficient vacuum air cooling drives out all heated air through one side vent, simplifying installation. Impulse-coupled, high-tension magneto ignition for quick starting under all conditions. Standard voltages 60-cycle A.C.

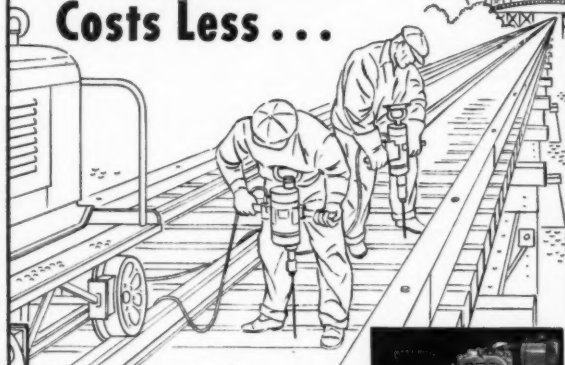
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**"U.S." Electric Plants
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Choose the right size and right type Electric Plant for each job from more than 300 models in the "U.S." line. Installing a unit designed for the job insures efficient operation. (Keeps costs down, too!) For all maintenance needs and stand-by use on signal systems. Write for information.



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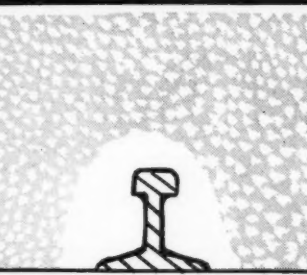
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PROPANE-FIRED SWITCH HEATERS



NO RE-DEPOSIT of snow
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It takes a load off your budget



The Cat* No. 6 Shovel, with its earth-eating two cubic yard bucket, not only does many jobs well—but it does them economically.

Here's off-track equipment that has the reach and dumping height (10'9") to load gondolas. It's your answer to work around culverts and overpasses, or snow removal in big yards. It's designed for use in restricted overhead areas. It handles excavations from initial digging to finish grading. It adapts itself easily to lifting heavy objects and serves as a heavy-duty lift fork for carrying loads across otherwise inaccessible ground.

Its uses are matched by its economy. Like all Caterpillar equipment, the No. 6 Shovel is always available when you need it. It has a 66 HP Cat Diesel Engine engineered for long life, positive starting on the coldest days. It operates on inexpensive No. 2 furnace oil, yet idles without fouling.

Its rough-and-ready frame is matched to your toughest jobs. Box-type cross brace ties the bucket lift arms

together preventing bucket sway. A box section support holds the shovel main frame and track frame into a single rugged structure.

And best of all, this tractor-shovel is completely built by one manufacturer. One dependable dealer provides service, relieves you of the cost of maintaining a large stock of parts. Your Caterpillar Dealer will demonstrate on your job. Call him today.

Caterpillar Tractor Co., Peoria, Illinois.

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WILL DEMONSTRATE**

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When one considers the weight of the great modern diesels and the heavily loaded freights carried daily over so many miles of track, the tremendous job of laying fine, safe track is better realized.


American roads are known the world over for their safety. This is due no doubt to the initial care and precautions taken to do the best job that can be done.

One relatively small but immensely important safety factor—and a great reducer of maintenance costs—is the powerful spring washer which maintains bolt tensions. The reserve power of these springs absorbs the terrific beating to which rails, joints and rail ends are subjected.



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A COMPLETE LINE OF RAILWAY SPRING WASHERS



55%
RETURN
ON INVESTMENT

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The economies inherent in propane gas switch heating are graphically shown in a recent report issued by a prominent eastern road.* On this road, for the period covered in the report, 5 switches and two derails were equipped with remote-controlled propane gas switch heaters.

It was shown that there was a reduction in annual operating expense of 80% with an annual return of 55% on the investment. This report provides significant evidence that RAIL-TEL remote-controlled switch heaters are an economical investment.

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